

LX245

User Guide



Viglen®

Great
Minds
Think

Viglen®

COMPUTERS • NETWORKS • SOLUTIONS

Viglen LX245 Server Guide – MA-LX245-0A-01

Viglen, EMC and the 'CE' mark

CE Marking

As we begin the 21st century, European standards are being harmonised across borders. If products comply with the same standards in all European countries, product exporting and importing is made simple - paving our way to a common market. If you buy a product with a 'CE' mark on it (shown below), on the box, in the manual, or on the guarantee - it complies with the currently enforced directive(s).



Introduction to EMC

EMC (Electromagnetic Compatibility) is the term used to describe certain issues with RF (Radio Frequency) energy. Electrical items should be designed so they do not interfere with each other through RF emissions. E.g. If you turn on your microwave, your television shouldn't display interference if both items are CE marked to the EMC directive.

If emitted RF energy is not kept low, it can interfere with other electrical circuitry - E.g. Cars Automatic Braking Systems have been known to activate by themselves while in a strong RF field. As this has obvious repercussions ALL electrical products likely to cause RF related problems have to be 'CE' marked from 1st January 1996 onwards.

If a product conforms to the EMC directive, not only should its RF emissions be very low, but its immunity to RF energy (and other types) should be high. The apparatus has to resist many 'real world' phenomena such as static shocks and mains voltage transients.

Viglen's Environment laboratory

To gain a 'CE' mark, the Viglen computer range has had to undergo many difficult tests to ensure it is Electromagnetically Compatible. These are carried out in the in-house 'Environment lab' at Viglen Headquarters. We have made every effort to guarantee that each computer leaving our factory complies fully with the correct standards. To ensure the computer system maintains compliance throughout its functional life, it is essential you follow these guidelines.

Install the system according to Viglen's instructions

If you open up your Viglen System:

- Keep internal cabling in place as supplied.
- Ensure the lid is tightly secured afterwards
- Do not remove drive bay shields unless installing a 'CE' marked peripheral in its place
- The clips or 'bumps' around the lips of the case increase conductivity - do not remove or damage.
- Do not remove any ferrite rings from the L.E.D cables.
- Only use your Viglen computer with 'CE' marked peripherals

This system has been tested in accordance with European standards for use in residential and light industrial areas- this specifies a 10 meter testing radius for emissions and immunity. If you do experience any adverse affects that you think might be related to your computer, try moving it at least 10 meters away from the affected item. If you still experience problems, contact Viglen's Technical Support department who will put you straight through to an EMC engineer - s/he will do everything possible to help. If modifications are made to your Viglen computer system, it might breach EMC regulations. Viglen take no responsibility (with regards to EMC characteristics) of equipment that has been tampered with or modified.

Copyrights and Trademarks

Please note

The material in this manual is subject to change without notice.

Trademarks

Microsoft, Windows, Windows XP, Windows 2000, Windows NT, Windows 95, MS-DOS and OS/2 are registered trademarks of Microsoft Corporation. i386, i486, Xeon, Pentium, Pentium Pro and MMX are registered trademarks of Intel Corporation. JAC-UP, Contender, Dossier, Vig, Viglen, and Envy are trademarks of Viglen Limited. Genie and Contender are registered trademarks of Viglen Limited.

Copyright and Patents

This manual and all accompanying software and documentation are copyrighted and all rights reserved. This product, including software and documentation, may not, in whole or in part, be copied, photocopied, translated or reduced to any electronic or machine-readable form, without prior written consent except for copies retained by the purchaser for backup.

© Copyright 2002 Viglen Limited
All Rights Reserved
Viglen LX245 Server System – User Guide Version 2.1
Printed in the United Kingdom

Liability

No warranty or representation, either expressed or implied, is made with respect to this documentation, its quality, performance, merchantability or fitness for a particular purpose. As a result the documentation is licensed as is, and you, the licensee, are assuming the entire risk as to its quality and performance. The vendor reserves the right to revise this operation manual and all accompanying software and documentation and to make changes in the content without obligation to notify any person or organisation of the revision or change.

In no event will the vendor be liable for direct, indirect, special, incidental or consequential damages arising out of the use or inability to use this product or documentation, even if advised of the possibility of such damages. In particular, the vendor shall not have liability for any hardware, software or data stored or used with the product, including the costs of repairing, replacing or recovering such hardware, software or data.

Contents

1. Overview	6
Introduction	6
2. LX245 Chassis Specifications	8
Physical Specifications	8
Chassis Features	8
Front Panel Controls and Indicators	9
Chassis Back I/O Ports and Features	10
Chassis Feature Summary	11
SCSI Hot-Swap Backplane Layout and Settings	12
SCSI ID Jumper Setting List	13
Chassis Error and Message Indicators	13
3. VIG340B Motherboard Specifications	14
Server Board Features	14
VIG340B Server Board Layout	15
Back Panel Connectors	17
Server Board Feature Overview	18
Chipset Overview	21
Microprocess	22
Main Memory	22
Super I/O Controller	23
Serial Ports	24
Parallel Ports	24
Floppy Controller	24
Keyboard and Mouse Interface	24
Real-time Clock, CMOS SRAM, and Battery	25
IDE Support	25
LS-120 Support	25
Expansion Slots	26
VIG340B Server Board Special Features	27
ACPI Features	29
Power Supply	30
4. VIG340B Server Board Options	31
Overview of Jumper Settings	33

Clear CMOS	34
LAN1 Enabled/Disabled	35
LAN2 Enabled/Disabled	35
VGA Enabled/Disabled	36
Power Supply Alarm Enabled/Disabled	36
SCSI Enabled/Disabled	37
SCSI Termination Enabled/Disabled	37
CPU Chassis/CPU Fan Select	38
Watchdog timer Enabled/Disabled	38
Thermal Fan Enabled/Disabled	39
PCI-X Bus Speed Settings	40
Overview of Server Board Connectors	44
Front Control Panel Connector	44
ATX Power Connector	45
PWR_SEC Connector	45
Power LED	46
Hard Disk LED	46
NIC2 LED	46
NIC1 LED	47
Overheat LED (OH)	47
Power Fail Button	47
Reset Button	48
Power Button	48
Universal Serial Bus (USB 0/1)	49
Extra Universal Serial Bus (USB 2/3/4)	49
Chassis Intrusion	49
Serial Ports	50
ATX PS/2 Keyboard and PS/2 Mouse Ports	50
Fan Headers	51
Power LED/Speaker/NMI	51
Third Power Supply Fail Header	52
LAN1/2 (Ethernet Ports)	52
Wake-On-LAN	53
Wake-On-Ring	53
Parallel Port, Floppy/Hard Disk Drive and SCSI Connectors	54
Installing Memory DIMMs	57
PGA Processor and Heatsink Installation	59
Replacing the Clock/CMOS RAM Battery	61
5. Software Installation	62
6. System BIOS	63

Introduction	63
Main BIOS Setup Menu	64
Main Setup Menu Features	65
Advanced Setup Menu	68
Security Menu	75
Power Menu	77
Boot Menu	79
Exit Menu	83
Phoenix BIOS POST Messages	85
Phoenix BIOS POST Codes	91
Phoenix Error Beep Codes	95
7. Technical Information	96
SCSI Controller	96
IDE Controller	96
Network Controller	98
Equipment Log and Worksheets	99
Worksheet, Calculating DC Power Usage	100
Connector Pin Signal Details	101
Reliability Information	107
8. Glossary	108
9. Notes	114
10. Suggestions	118

1. Overview

Introduction

This manual describes the Viglen LX245 system and the VIG340B motherboard. The motherboard is the most important part of your computer. It contains all of the CPU, memory and graphics circuitry that makes the computer work.

The VIG340B motherboard contains the very latest in CPU design, the Intel Xeon processor, which includes dual processor support, Hyper-Threading technology, Intel NetBurst micro-architecture, Rapid Execution Engine, Streaming SIMD Extensions 2 (SSE2) and Advanced Dynamic Executions. Hyper-Threading technology has been developed to allow multi-processor server applications to execute more than one thread per processor. This in turn will increase the overall throughput of the Viglen server and enable you to scale with processor requirements to handle future workloads. Some of the immediate benefits include:

- Increased number of transactions that can be processed by each CPU.
- Enabling support for more users improving business productivity.
- Providing faster response time for websites and e-Business applications therefore enhancing your customer's experience.

Intel NetBurst micro-architecture provides the binary compatibility with previous generation Intel Architecture (IA-32) processors. Rapid Execution Engine means that the new Intel Xeon processors have two Arithmetic Logic Units (ALUs), which are clocked at twice the core processor frequency. This allows basic integer instructions such as Add, Subtract, Logical AND, Logical OR etc. to execute in $\frac{1}{2}$ a clock cycle. For example, the Rapid Execution Engine on a 2.20GHz Intel Xeon processor runs at 4.40GHz. Intel's SSE2 technology now extends the SIMD capabilities that MMX technology and SSE technology delivered by adding 144 new instructions. These instructions include 128-bit SIMD integer arithmetic and 128-bit SIMD double precision floating-point operations. These new instructions reduce the overall number of instructions required to execute a particular program task and as a result can contribute to an overall performance increase. This new technology can accelerate a broad range of applications, including video, speech, photo processing, encryption, engineering and scientific applications. Finally the Advanced Dynamic Execution engine is a very deep, out-of-order speculative execution engine that keeps the execution units executing instructions. The Intel Xeon processor can also view 126 instructions in flight and handle up to 48 loads and 24 stores in the pipeline.

This manual contains technical information about the Viglen VIG340B motherboard and other hardware components inside your computer. If you are new to computers we

recommend that you read the user guide first. If you are an experienced computer user this manual should provide all the information you will need to perform simple upgrades and maintenance.

We hope that this manual is both readable and informative. If you have any comments or suggestions about how we could improve the format then please fill out the form at the back of the manual and send it to us.

Above all we hope that you enjoy using your Viglen LX245 Server.

2. LX245 Chassis Specification

The LX245 chassis is designed to be either a pedestal unit or mounted in a 19" rack cabinet. If the server is bought as a Rackmount unit, then it will be supplied complete with a pair of industry standard 19" Rails, handles and all of the necessary nuts and bolts.

Physical Specifications

Table 1: Physical Specifications

Specifications	
Height	449 mm
Width / Rackmount Height	220 mm / 5U
Depth	622 mm
Weight	20 kg typical configuration

Chassis Features

The galvanised metal chassis minimises EMI and radio frequency interference (RFI). The removable access cover is attached to the chassis with two thumbscrews and provides easy access to the VIG340B Motherboard and power supply.

Chassis Front Controls and Indicators

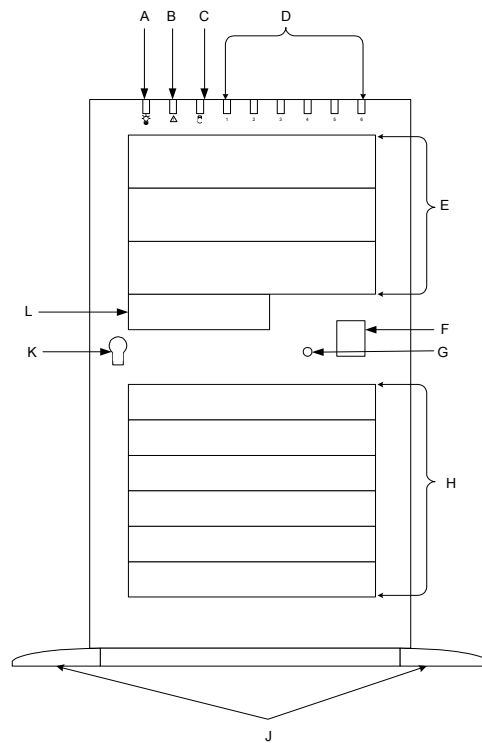


Figure 1: Chassis Front Controls and Indicators

A	Power LED	G	Reset Button
B	Error LED (Temperature & Fans)	H	Hot-swap Hard Disk Caddy
C	Local HD Access LED	J	Chassis Feet
D	Hard Disk Access LED	K	Door Lock
E	5.25-inch Bays	L	3.5" Bay
F	Power Button		

Chassis Back I/O Ports and Features

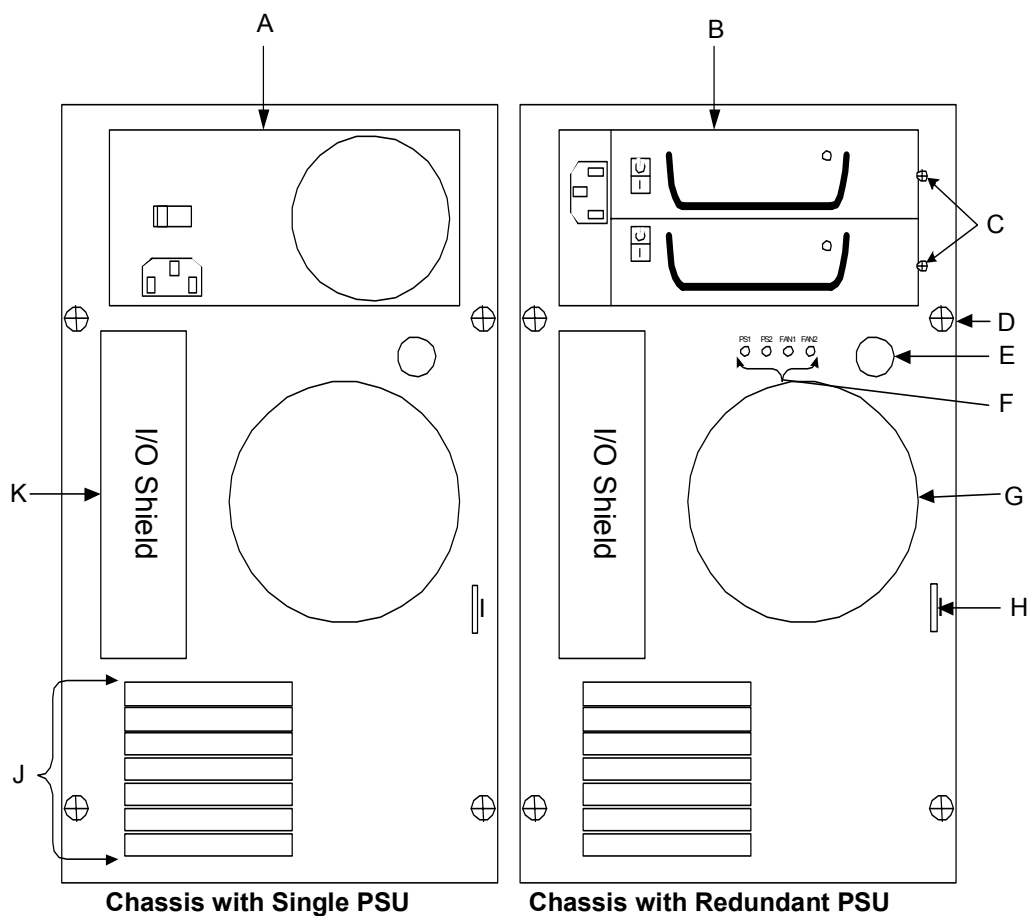


Figure 2: Chassis Back I/O Ports and Features

A	460W ATX PSU	F	Warning LEDs
B	337W ATX Redundant PSUs	G	12 cm fan for system cooling
C	Screws for securing PSUs	H	Padlock Plate
D	Thumb Screw	J	Expansion Slot Blanking Plates
E	Silent button for the alarm	K	I/O Shield (refer to Figure 6)

Chassis Feature Summary

Table 2: Chassis Features

Feature	Description
Drive Bays	One 3.5-inch diskette drive bay, accessible from front. Three 5.25-inch-wide bays that are externally accessible, designed to hold half-height standard removable media devices; the bays can be converted into a single full-height bay. Hot-swap bay for 3.5-inch hard disk drives: space for up to six 1-inch-high drives.
Baseboard	Viglen VIG340B Server Motherboard.
Power supply	Single 460W PSU or optional 337W Dual Redundant ATX power supply, with integrated cooling fan.
Hot-Swap Backplane	Hot-Swap Backplane board is mini storage enclosure that provides a stable and safe environment for RAID array systems. The hot swap bay is capable of accepting drives that are 3.5 inches wide and 1 inch high. Drives can consume up to 17 watts of power and must be specified to run at a maximum ambient temperature of 50°C. The bay allows users to install either a JBOD (Just A Bunch Of Disks) or a RAID (Redundant Array of Independent Disks) system.
Expansion slot covers	Six fully functional expansions slots can be used: every slot opening that does not have an add-In board Installed must have a slot cover installed.
Fan Module	Two 8 cm ball bearing cooling fans for Hot-Swap bay cooling.
System cooling Fan	One 12 cm ball bearing cooling fan for system cooling.
Chassis Intrusion Switch	The chassis provides a micro toggle switch; It is a two-wire switch that is connected to the VIG340B motherboard for chassis intrusion detection.

SCSI Hot-swap Backplane Layout and Settings

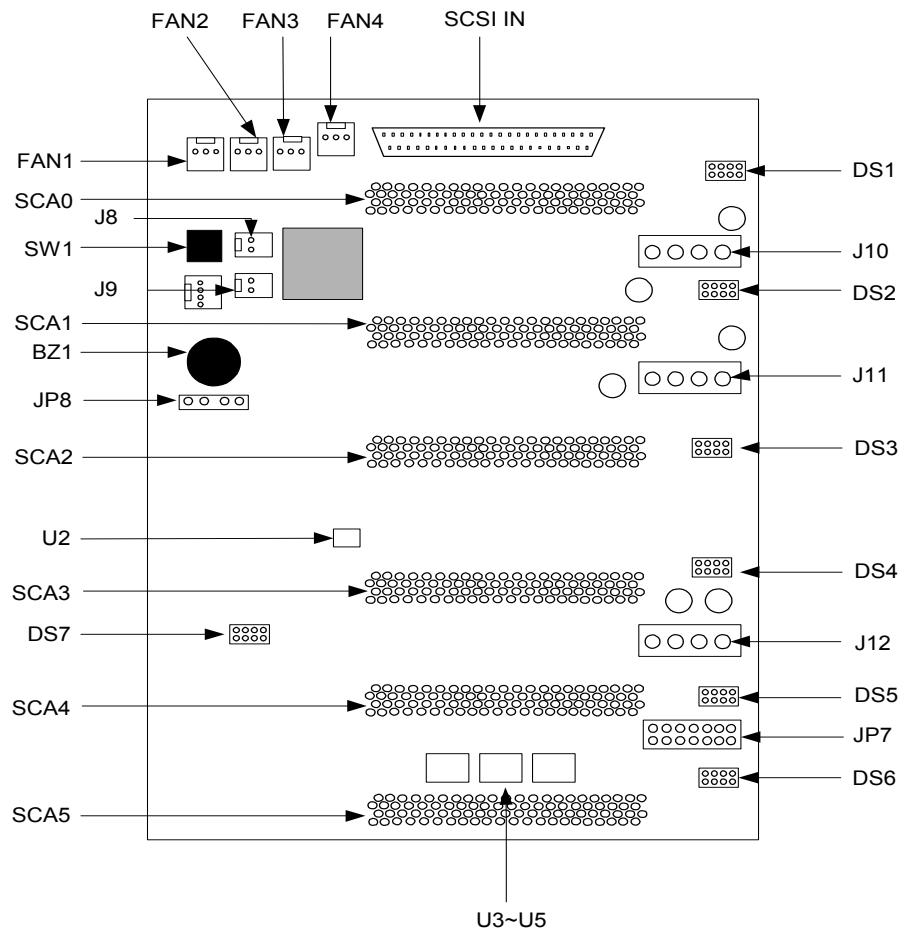


Figure 3: SCSI Hotswap Backplane Layout

Jumper/ Connector	Function
U2	Temperature detector
U3~U5	Ultra 160 LVD/SE terminators
FAN1 (Fan Failure)	Triggers the fault LED on the front panel if a fan fails
FAN2 (PSU Failure)	Triggers the fault LED on the front panel if a PSU fails
FAN3 (Hard Disk Failure)	Triggers the fault LED on the front panel if a hard drive fails
FAN4	External Fan 4 (Connectors not used)
J8	Connector not used
J9	External Intrusion Switch (micro switch) *
SW1	Buzzer silent button
BZ1	Buzzer will sound if a failure is detected by the firmware
J10~J12	Power input
JP7	Front Panel LED connector
DS1~DS6	Sets the hard disk drive 0~5 ID code
DS7	Sets the drive spin up mode

SCSI IN	SCSI Connector
SCA0~SCA5	SCA Hard Disk Connectors

* If J9 is not connected to the external intrusion switch a jumper must be inserted on this connector.

SCSI ID Jumper Setting List

The diagram below shows the different jumper settings to select the SCSI ID for the hot swap drive bays.

ID	0	1	2	3	4	5	6	7	
JUMPER SETTING	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/>	1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/>	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/>	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/>	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/>	1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/>	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/>	1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <input type="checkbox"/>	
	ID	8	9	A	B	C	D	E	F
	JUMPER SETTING	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input type="checkbox"/> <input type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 2 <input type="checkbox"/> <input type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	1 <input type="checkbox"/> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	1 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

Figure 4: SCSI ID Jumper Settings

Chassis Error and Message Indicators

The table below explains the error messages for the chassis and hot swap bays, through the beeps and LED patterns.

Table 3: Chassis Error and Message Indicators

Error Message	Explanation
Continuous beep and flashing error LED	Hot swap bay temperature has exceeded 42°C.
A beep followed by a 7 second gap, at the back of the chassis (server with redundant PSU) an error LED will flash	Power Supply Unit fan or PSU has failed (fan may be spinning at below 1200rpm).

NOTE: The audible alarm can be made silent by pressing the red button below and to the side of the Power Supply Unit, to re-activate the beeping press the button again.

3. VIG340B Motherboard Specification

Server Board Features

Table 4: Server Board Features

Feature	Description
Processor	Up to two Intel® Xeon® processors in a new 603-Pin Micro-PGA Grid Array package.
Memory (DRAM)	Support for up to 16GB ECC registered DDR-266MHz memory in 8 DIMM slots (Two way interleaving)
PCI bus	Seven PCI slots: <ul style="list-style-type: none">- Two 64-bit 100MHz PCI-X slots.- Four 64-bit 66MHz PCI slots.- One VXB (Virtual eXtended Bus) 133MHz slot.
Graphics	Integrated onboard ATI Rage [†] XL 8MB 32-bit PCI SVGA controller.
SCSI	Adaptec [†] AIC-7899W dual channel Ultra160 SCSI, supporting onboard Ultra2 (LVD) wide, Ultra-wide and Ultra160 SCSI interfaces.
Network	Integrated dual onboard NICs, an Intel® 82550 PCI LAN controller for 10/100 Mbps TX Fast Ethernet networks. RJ-45 Ethernet connector at I/O back panel.
System I/O	PS/2 [†] -compatible keyboard and mouse ports, 6 pin DIN. Advanced parallel port, supporting Enhanced Parallel Port (EPP), Compatible 25 pin. VGA video port, 15 pin. Two serial ports, two 9-pin connectors on the rear I/O. Two RJ-45 Ethernet. Two USB ports.
Form Factor	Server ATX form factor, ATX 2.03 compliant I/O.

VIG340B Server Board Layout

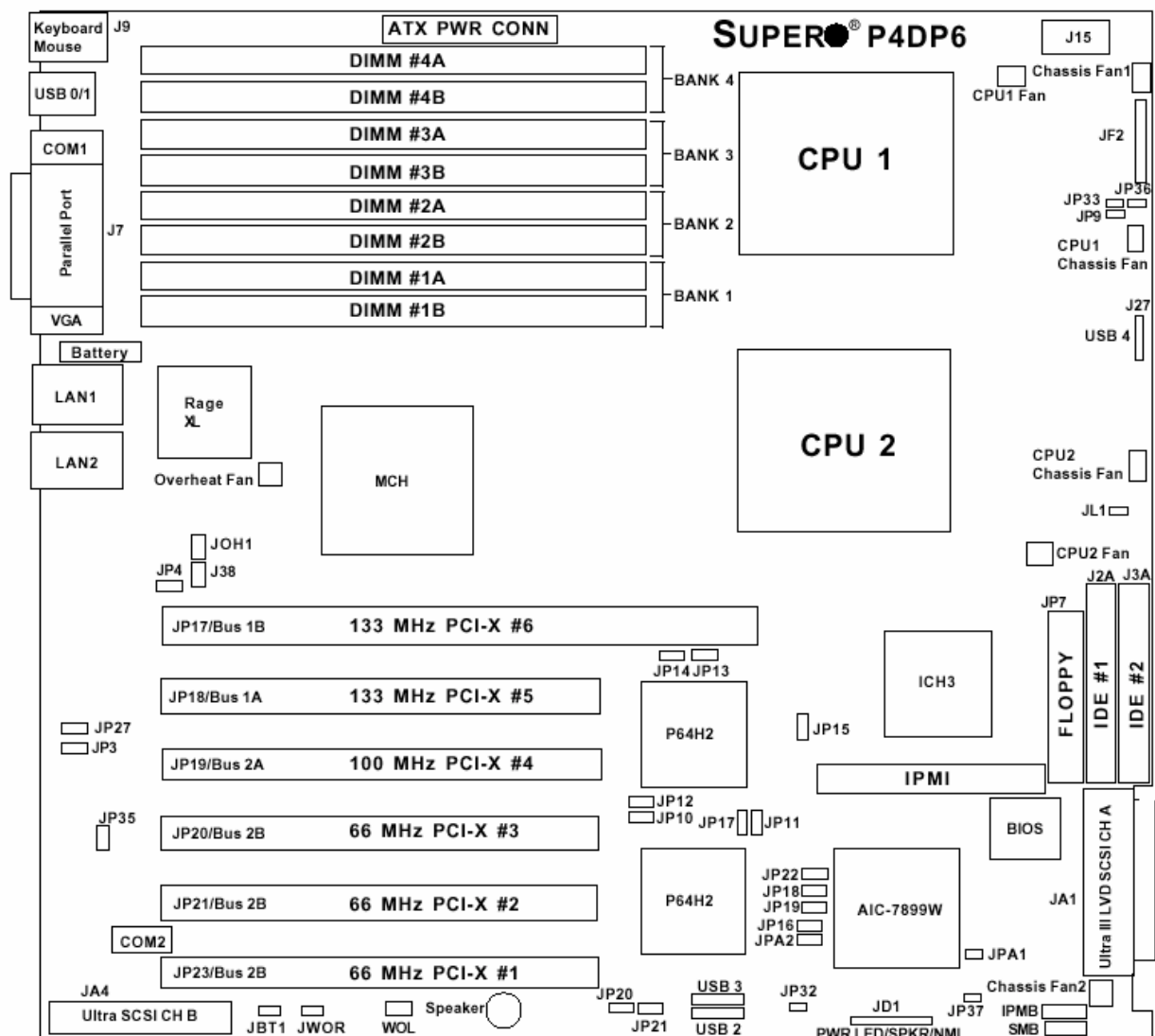


Figure 5: VIG340B Motherboard Specification

Jumper	Description	Default Settings
JBT1	CMOS Clear	Pins 1-2 (Normal)
JPA1/JPA2	SCSI Channel A/B Termination	Open (Enabled)
JP3/JP27	LAN1/LAN2 Enabled/Disabled	Pins 1-2 (Enabled)
JP4	VGA Enabled/Disabled	Pins 1-2 (Enabled)
JP9	Power Fail Alarm Enabled/Disabled	Open (Disabled)
JP10/JP21	PCI-X Bus Speed Setting	
JP22	SCSI Enabled/Disabled	Pins 1-2 (Enabled)
JP33	CPU Chassis/CPU FAN Select	Closed (CPU Fan)
JP37	Watchdog Enabled/Disabled	Open (Disabled)
JP38	Thermal Fan Enabled/Disabled	Open (BIOS Control)

Connector	Description
ATX PWR CONN	Primary ATX Power Connector
DIMM#1A – DIMM#4B	Memory (RAM) Slots
COM1/COM2	COM1/COM2 Serial Port Connectors
CPU/CHS/OH FAN	CPU/Chassis/ Overheat Fan Headers
J7	Parallel (Printer) Port
J9	PS/2 Keyboard/Mouse Ports
J13/J14	USB 2/3 Headers
J15	Secondary ATX Power Connector
J2A/J2B	IDE #1/#2 Hard Disk Drive Connectors
JA1	Ultra 160 LVD SCSI Channel A Connector
JA4	Ultra 160 LVD SCSI Channel B Connector
JD1	Power LED/Speaker/NMI Header
JF2	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP7	Floppy Disk Drive Connector
JP9	Third Power Supply Fail Header
JP32	ACPI/Sleep Button Header
JP35	Keylock Switch Connector
JP36	Alarm Reset Switch
JWOR	Wake-on-Ring Header
LAN1/2	Ethernet Ports
SCSI LED	SCSI Active LED Header
Speaker	Onboard Speaker Header
USB 0/1, 2/3	Universal Serial Bus Ports, Headers
VGA	VGA Display (Monitor) Port
WOL	Wake-on-LAN Header

Jumpers that are not included are for Viglen test purposes only and must not be moved.

Back Panel Connectors

The motherboard external I/O connectors are attached to a metallic I/O shield. This shield serves several purposes:

- It protects the sensitive motherboard from any external EMC problems.
- It stops the computer from interfering with other electrical devices.
- It allows the motherboard to be easily upgraded in the future without having to resort to buying a whole new case. Simply change the I/O shield to match the motherboard.

The I/O shield provides external access to PS/2 keyboard and mouse connectors as well as two serial ports, one parallel port, two RJ45 Local Area Network (LAN) connections and two Universal Serial Bus ports.

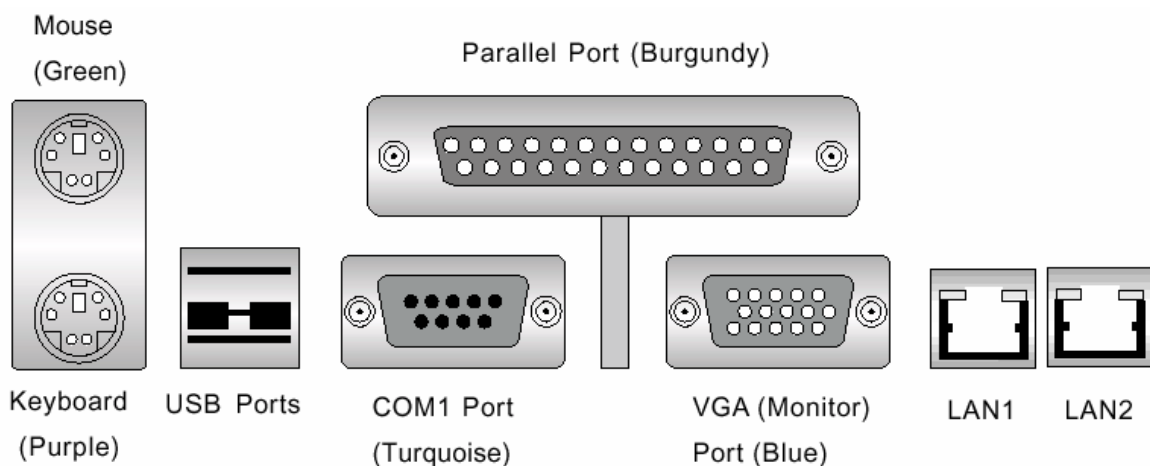


Figure 6: Rear I/O Shield

NOTE: The mouse and keyboard **CANNOT** be plugged into either of the PS/2 connectors while the system is powered on. Power to the system must be turned off before a keyboard or mouse is connected or disconnected.

Server Board Feature Overview

The VIG340B server board supports single or dual 603-Pin Micro-PGA form factor processors running between 1.8GHz to 2.2GHz with 512K L2 Cache and a maximum bus speed support of 400MHz.

Form Factor

- ATX form factor of 12 inches x 13.05 inches.

Chipset

- Intel E7500 (Plumas) chipset.

Microprocessor

- Single or dual Intel Xeon processors using socket 603-Pin connectors.
- 400MHz Front Side Bus speed.
- 512KB second-level Advanced Transfer cache on the substrate.

Main Memory

- Eight 184-pin DDR DIMM sockets supporting up to 16GB of registered ECC PC-266MHz DDR SDRAM.

NOTE: Interleaved memory requires memory modules to be installed two at a time. When pairing the modules do not mix memory sizes and speeds.

Expansion Slots

- Two 64-bit, 133MHz PCI-X slots.
- One 64-bit, 100 MHz PCI-X slots.
- Three 64-bit, 66MHz PCI-X slots.

BIOS

- 4MB Phoenix Flash ROM.
- APM 1.2, DMI 2.1, PCI 2.2, ACPI 1.0, Plug and Play (PnP), SMBIOS 2.3

PC Health Monitoring

- Onboard voltage monitors for CPU cores, chipset voltage, 3.3V, +5V, +12V and 3.3V standby.
- Four-fan status monitor with firmware/software on/off control.
- Three CPU/chassis temperature monitors.
- Environmental temperature monitor and control.
- CPU fan auto-off in sleep mode.
- CPU slow-down on temperature overheat.
- CPU overheat LED header.
- Power-up mode control for recovery from AC power loss.
- Auto-switching voltage regulator for CPU core.
- System overheat LED and control.
- Chassis intrusion detection.
- System resource alert.
- IPMI 1.5 compliant.

Onboard I/O

- AIC-7899 for dual channel Ultra160 SCSI.
- Adaptec 2000S Zero-Channel RAID connector (green PCI-X slot).
- Integrated ATI Rage XL 8MB graphics controller.
- Two Intel PRO/100s (82550) 10/100 fast Ethernet controllers (two Ethernet ports).
- Two EIDE Ultra DMA/100 bus master interfaces.
- One floppy port interface (up to 2.88 MB).

- Two Fast UART 16550A compatible serial ports.
- One EPP/ECP Parallel Port (Enhanced Parallel Port/Extended Capabilities Port).
- PS/2 mouse and PS/2 keyboard ports.
- Up to 5 USB (Universal Serial Bus) ports.

Chipset Overview

The Intel E7500 (Plumas) chipset is a high-performance chipset with a performance and feature-set designed for mid-range, dual processor servers. The E7500 chipset consists of four major components: the Memory Controller Hub (MCH), the I/O Controller Hub 3 (ICH3), the PCI-X 64-bit Hub 2.0 (P64H2) and the 82808AA Host Channel Adapter (VxB).

The MCH has four hub interfaces, one to communicate with the ICH3 and three for high-speed I/O communications. The MCH employs a 144-bit wide memory bus for a DDR-266 memory interface, which provides a total bandwidth of 3.2 GB/s. The ICH3 interface is a 266 MB/sec point-to-point connection using an 8-bit wide, 66 MHz base clock at a 4x data transfer rate.

The P64H2 interface is a 1 GB/s point-to-point connection using a 16-bit wide, 66 MHz base clock at an 8x data transfer rate. The ICH3 I/O Controller Hub provides various integrated functions, including a two-channel UDMA100 bus master IDE controller, USB host controllers, an integrated LAN controller, a System Management Bus controller and an AC'97 compliant interface.

Each of the three P64H2 PCI-X Hubs provides a 16-bit connection to the MCH for high-performance IO capability and two 64-bit PCI-X interfaces.

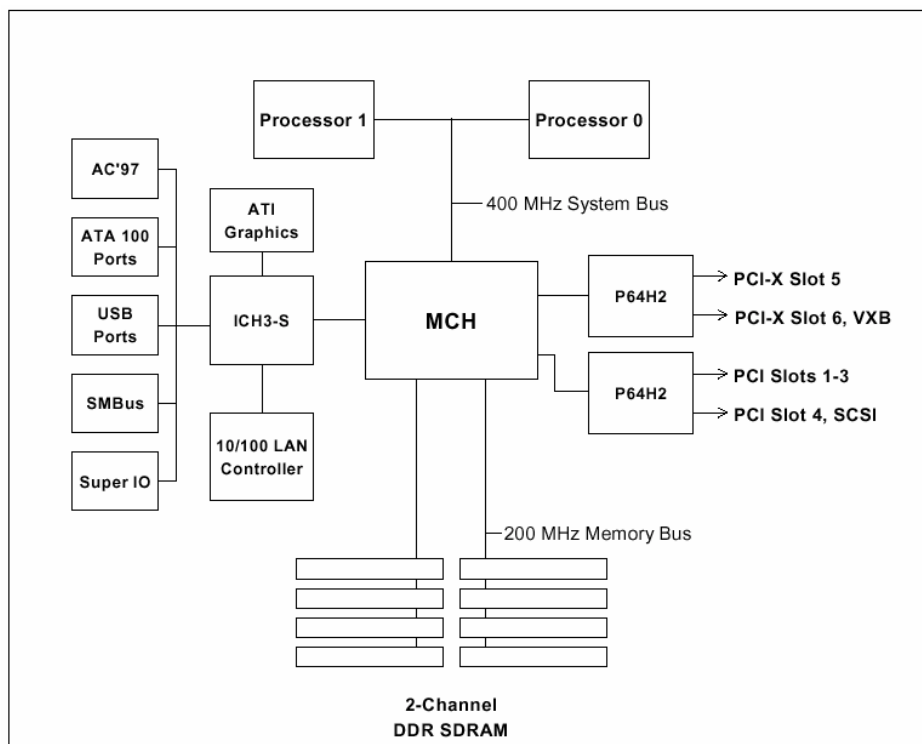


Figure 7: Intel E7500 Chipset system Block Diagram

Microprocessor

The motherboard has two 603-pin sockets, which support Intel Xeon Micro-PGA processors. The processor's VID pins automatically program the voltage regulator on the motherboard to the required processor voltage. The motherboard currently supports processors that run internally at 1.8GHz to a possible maximum of 2.2GHz with 400 MHz front side bus and 512KB second-level cache. These new Xeon processors include dual processor support, Hyper-Threading technology, Intel NetBurst micro-architecture, Rapid Execution Engine, Streaming SIMD Extensions 2 (SSE2) and Advanced Dynamic Executions (see Chapter 1 for an overview of these features). The processor's numeric coprocessor significantly increases the speed of floating-point operations and complies with ANSI/IEEE standard 754-1985.

Main Memory

The motherboard has eight dual inline memory module (DIMM) sockets. The minimum memory size is 256MB and the maximum memory size is 16GB. The BIOS automatically detects memory type, size, and speed.

The motherboard only supports the following memory features:

- 184-pin DIMMS with gold-plated contacts.
- 266MHz DDR SDRAM only.
- ECC (72-bit) Registered memory only
- Single or double-banked DIMMs in the following sizes:

Table 5: DIMM Sizes

DIMM Size	ECC Configuration	Unbuffered/Registered
128 MB	16 Mbit x 72	Registered Only
256 MB	32 Mbit x 72	Registered Only
512 MB	64 Mbit x 72	Registered Only
1 GB	128 Mbit x 72	Registered Only

NOTE: Interleaved memory requires memory modules to be installed two at a time. When pairing the modules do not mix memory sizes and speeds.

DDR

DDR technology enables the data to be processed on both the upward and downward signal slopes. This results in twice the performance when compared to SDR where only a single process per signal slope is used.

SDRAM

Synchronous DRAM (SDRAM) improves memory performance through memory access that is synchronous with the memory clock. This simplifies the timing design and increases memory speed because all timing is dependent on the number of memory clock cycles.

ECC Memory

Error checking and correcting (ECC) memory detects multiple-bit errors and corrects single-bit errors.

Super I/O controller

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic. The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives. The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s. It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system.

Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP), Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP).

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

The IRQs, DMAs and I/O space resources of the Super I/O can flexibly adjust to meet ISA PnP requirements, which support ACPI and APM (Advanced Power Management).

Serial Ports

Two compatible 9-pin D-Sub serial port connectors, both are located on the back IO panel see **Figure 6**.

Each serial port has a 16-byte send/receive FIFO, a programmable baud rate generator; complete modem control capability and a processor interrupt system. Both ports provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250K, 500K, or 1 Mb/s, which support higher speed modems.

Parallel Port

The Super I/O supports one PC-compatible printer port (SPP), Bi-directional Printer Port (BPP), Enhanced Parallel Port (EPP) or Extended Capabilities Port (ECP). The connector for the multimode bidirectional parallel port is a 25-pin D-Sub connector located on the back panel. In the Setup program, the parallel port can be configured for the following:

- Compatible (standard mode)
- Bidirectional
- Extended Parallel Port (EPP) Levels 1.7 & 1.9
- Enhanced Capabilities Port (ECP)

Floppy Controller

In the Setup program, the floppy interface can be configured for the following floppy drive capacities and sizes:

- 360 KB, 5.25-inch
- 1.2 MB, 5.25-inch
- 720 KB, 3.5-inch
- 1.44 MB, 3.5-inch
- 2.88MB, 3.5-inch

Keyboard and Mouse Interface

PS/2 keyboard and mouse connectors are located on the back panel. The 5V lines to these connectors are protected with a PolySwitch circuit that, like a self-healing fuse, re-establishes the connection after an over-current condition is removed.

The keyboard controller contains the AMI Megakey keyboard and mouse controller code, which provides the keyboard and mouse control functions, and supports password protection for power on/reset. A power on/reset password can be specified in Setup.

The keyboard controller also supports the hot-key sequence <Ctrl><Alt> for a software reset. This key sequence resets the computer's software by jumping to the beginning of the BIOS code and running the Power-On Self Test (POST).

Real-time Clock, CMOS SRAM, and Battery

The clock provides a time-of-day clock and a multicentury calendar with alarm features and century rollover.

The time, date, and CMOS values can be specified in the Setup program. The CMOS values can be returned to their defaults by using the Setup program.

An external coin-cell battery powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the 3.3-V standby current from the power supply extends the life of the battery. The clock is accurate to ± 13 minutes/year at 25 °C with 3.3V applied.

IDE Support

The motherboard has two independent bus-mastering PCI IDE interfaces. These interfaces support PIO Mode 3, PIO Mode 4, ATAPI devices (e.g., CD-ROM), and DMA mode transfers. The BIOS supports logical block addressing (LBA) and cylinder head sector (CHS) translation modes. The BIOS automatically detects the IDE device transfer rate and translation mode.

Programmed I/O operations usually require a substantial amount of processor bandwidth. However, in multitasking operating systems, the bandwidth freed by bus mastering IDE can be devoted to other tasks while disk transfers are occurring.

LS-120 Support

LS-120 MB Diskette Technology enables you to store 120MB of data on a single, 3.5" removable diskette. LS-120 technology is backward (both read and write) compatible with 1.44MB and 720KB DOS-formatted diskette and is supported by the Windows NT operating system.

The Newton board allows connection of an LS-120 compatible drive and a standard 3½" floppy drive. The LS-120 drive can be configured as a boot device before a floppy drive, if selected in the BIOS setup utility.

NOTE: If you connect an LS-120 drive to an IDE connector and configure it as the “A” drive and configure a standard 3.5” floppy as “B” drive, the standard floppy must be connected to the floppy drive cable’s “A” connector (the connector at the end of the cable).

The BIOS setup utility can be configured to boot firstly from either the LS120 or standard 3½” floppy drive.

Expansion Slots

The VIG340B server board has six full length PCI-X connectors, shown as slots in *Figure 5*.

NOTE: If you install a PCI-33 card into one of the PCI-66/100 slots, the bus speed for that and it’s associated slots will have to be lowered to 33 MHz.

VIG340B Server Board Special Features

ATi Graphics Controller

The VIG340B has an integrated ATi video controller based on the Rage XL graphics chip. The Rage XL fully supports sideband addressing and AGP texturing. This onboard graphics package can provide a bandwidth of up to 512 MB/sec over a 32-bit graphics memory bus.

BIOS Recovery

The BIOS Recovery function allows you to recover your BIOS image file if the BIOS flashing procedure fails (see Chapter XXX).

Recovery from AC Power Loss

The BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power-on state. See the Power Lost Control setting in the Advanced BIOS Setup section (Peripheral Device Configuration) to change this setting. The de-fault setting is Always On.

PC Health Monitoring

This section describes the PC health monitoring features of the Viglen VIG340B Server Board. The motherboard has an onboard System Hardware Monitor chip that supports PC health monitoring.

Onboard Voltage Monitors for the CPU Cores, Chipset Voltage, +3.3V, +5V, +12V and +3.3V Standby.

An onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware/Software On/Off Control

The PC health monitor can check the RPM status of the cooling fans. The onboard 3-pin CPU and chassis fans are controlled by the power management functions. The thermal fan is controlled by the overheat detection logic.

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. It can continue to monitor for overheat conditions even when the CPU is in sleep mode. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal control fan to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

CPU Fan Auto-Off in Sleep Mode

The CPU fan activates when the power is turned on. It continues to operate when the system enters Standby mode. When in sleep mode, the CPU will not run at full power, thereby generating less heat.

CPU Overheat LED and Control

This feature is available when the user enables the CPU overheat warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded, both the overheat fan and the warning LED are triggered.

System Resource Alert

This feature is available when used with Intel's LANDesk Client Manager (optional). LDCM is used to notify the user of certain system events. For example, if the system is running low on virtual memory and there is insufficient hard drive space for saving the data, you can be alerted of the potential problem.

Hardware BIOS Virus Protection

The system BIOS is protected by hardware that prevents viruses from infecting the BIOS area. The user can only change the BIOS content through the flash utility provided by SuperMicro. This feature can prevent viruses from infecting the BIOS area and destroying valuable data.

Auto-Switching Voltage Regulator for the CPU Core

The auto-switching voltage regulator for the CPU core can support up to 20A current and auto-sense voltage IDs ranging from 1.4V to 3.5V. This will allow the regulator to run cooler and thus make the system more stable.

ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers. This also includes consumer devices connected to the PC such as VCRs, TVs, telephones and stereos.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with both Windows 98 and Windows NT 5.0.

NOTE: To utilise ACPI, you must reinstall Windows 98. To reinstall Windows 98 with ACPI, enter DOS and type "setup /pj" at the CDROM prompt (usually D:\) with the Windows 98 CD loaded. (Make sure you include the spaces after "setup" and "p".) Then hit <Enter>. You can check to see if ACPI has been properly installed by looking for it in the Device Manager, which is located in the Control Panel in Windows.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

External Modem Ring-On

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, up-dates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboards have a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. Wake-On-LAN must be enabled in BIOS. Note that Wake-On-LAN can only be used with an ATX 2.01 (or above) compliant power supply.

Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates.

The Viglen VIG340B Server Board accommodates ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You should use one that will supply at least 460W of power and includes the additional +12V, 8-pin power connector - an even higher wattage power supply is recommended for high-load configurations.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant (info at <http://www.ssiforum.org/>). Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

4. VIG340B Server Board Options

The VIG340B Server Board is capable of accepting 1.8GHz to a possible maximum of 2.2GHz Intel Xeon processors. Main memory (RAM) can also be upgraded to a maximum of 16GB using registered ECC DDR SDRAM DIMMs.

WARNING & CAUTIONS

WARNING!

Unplug the system before carrying out the procedures described in this chapter. Failure to disconnect power before you open the system can result in personal injury or equipment damage. Hazardous voltage, current, and energy levels are present in this product. Power switch terminals can have hazardous Voltages present even when the power switch is off.

The procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.

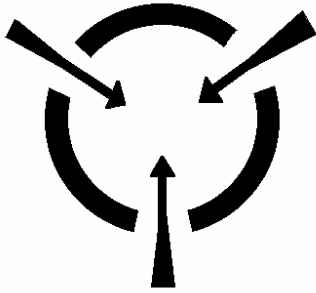
Do not operate the system with the cover removed. Always replace the cover before turning on the system.

As the colours of the wires in the mains lead of this computer may not correspond with the coloured markings identifying the terminals in your plug precede as follows:

The wire that is coloured green-and-yellow must be connected to the terminal in the plug, which is marked by the letter **E** or coloured green or green-and-yellow.

The wire that is coloured blue must be connected to the terminal, which is marked with the letter **N** or coloured black.

The wire that is coloured brown must be connected to the terminal, which is marked with the letter **L** or coloured red.

**CAUTION!**

The Viglen Newton motherboard and associated components are sensitive electronic devices. A small static shock from your body can cause expensive damage to your equipment.

Make sure you are earthed and free of static charge before you open the computer case. If you are unsure about upgrading your computer, return it to Viglen so a qualified engineer can perform the upgrade.

STEPS TO TAKE TO PREVENT STATIC DISCHARGE:

1. The best way to prevent static discharge is to buy an anti-static strap from your local electrical shop. While you are wearing the strap and it is earthed, static charge will be harmlessly bled to ground.
2. Do not remove the component from its anti-static protective packaging until you are about to install it.
3. Hold boards by the edges - try not to touch components / interface strips etc.

NOTE: We recommend that you return your computer to the service department for upgrading. Any work carried out is fully guaranteed. Upgrades should only be carried out by persons who are familiar with handling PC's, as incorrect installation will invalidate the guarantee.

Overview of Jumper Settings

The system motherboard inside your computer contains headers and jumpers. Different pin and jumper configurations make it possible to change how the computer functions. This section of the manual should give you all the information you will require making any changes.

Changes you can make, in this way, are as follows:

- Reset the CMOS RAM settings to the default values.
- Setting the Front Side Bus Speed
- Enabling or disabling SCSI termination
- Enabling or disabling the onboard Network Connector
- Selecting PCI 64-Bit bus speed

CAUTION!

Never remove jumpers using large pliers as this can damage the pins. The best way to remove a jumper is to use a small pair of tweezers or fine needle-nosed pliers.

Never remove a jumper when the computer is switched on. Always switch the computer off first.

Jumper Explanation

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

NOTE: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

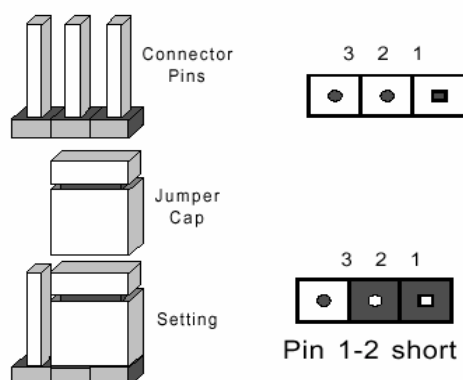


Figure 8: Server Board Jumpers

Clear CMOS

Refer to the table on the right for the JBT jumper settings to clear CMOS. Always remove the AC power cord from the system before clearing CMOS.

NOTE: For an ATX power supply, you must completely shut down the system, remove the AC power cord and then use JBT to clear CMOS. Replace JBT back to the pin 1-2 position before powering up the system again. Do not use the PW_ON connector to clear CMOS.

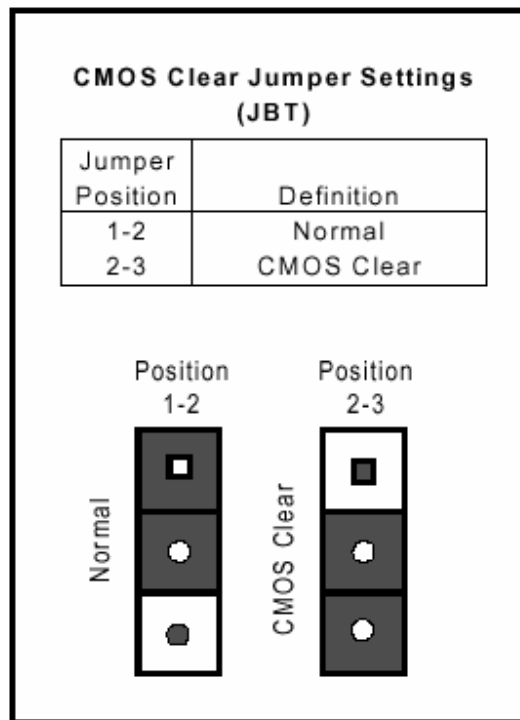


Figure 9: Clear CMOS Jumper

LAN1 Enabled/Disabled

Change the setting of jumper JP3 to enable or disable the onboard LAN1 or NIC (Network Interface Card) on the motherboard. See the below for jumper settings. The default setting is pins 1-2.

LAN1 (NIC) Enable/Disable Jumper Settings (JP3)	
Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Figure 10: LAN1 Enabled/Disabled

LAN2 Enabled/Disabled

Change the setting of jumper JP27 to enable or disable the onboard LAN2 or NIC (Network Interface Card) on the motherboard. See the table below for jumper settings. The default setting is pins 1-2.

LAN2 (NIC) Enable/Disable Jumper Settings (JP27)	
Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Figure 11: LAN2 Enabled/Disabled

VGA Enabled/Disabled

JP4 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table below for jumper settings.

VGA Enable/Disable Jumper Settings (JP4)	
Jumper Position	Definition
1-2	Enabled
2-3	Disabled

Figure 12: VGA Enabled/Disabled

Power Supply Alarm Enabled/Disabled

The system will notify you in the event of a power supply failure. This feature assumes that three power supply units are installed in the chassis, with one acting as a backup. If you only have one or two power supply units installed, you should disable this (the default setting) with JP9 to prevent false alarms. See the table below for jumper settings.

Power Supply Alarm Enable/Disable Jumper Settings (JP9)	
Jumper Position	Definition
Open	Disabled
Closed	Enabled

Figure 13: Power Supply Alarm Enabled/Disabled

SCSI Enabled/Disabled

The SCSI Termination jumper at JP22 allows you to enable or disable the onboard SCSI controller. The normal (default) position is on pins 1-2 to enable SCSI termination. See the table below for jumper settings.

SCSI Enable/Disable Jumper Settings (JP22)	
Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

Figure 14: SCSI Enabled/Disabled

SCSI Termination Enabled/Disabled

Jumpers JPA1 and JPA2 allow you to enable or disable termination for the individual SCSI channels. Jumper JPA1 controls SCSI channel A and JPA2 controls SCSI channel B. The normal (default) setting is open to enable (terminate) both SCSI channels. If you wish to connect external SCSI devices, you should disable termination for the channel(s) you will be connecting them to. See the table below for jumper settings.

SCSI Channel Termination Enable/Disable Jumper Settings (JPA1, JPA2)	
Jumper Position	Definition
Open	Enabled
Closed	Disabled

Figure 15: SCSI Termination Enabled/Disabled

CPU Chassis/CPU Fan Select

JP33 allows you to select to use either the CPU fan or the Chassis fan. The default position is open to select the CPU fan. The CPU Chassis fan is intended for use with SuperMicro chassis. See the table below for jumper settings.

CPU Chassis/CPU Fan Select Jumper Settings (JP33)	
Jumper Position	Definition
Open	CPU
Closed	CPU Chassis

Figure 16: CPU Chassis/CPU Fan Select

Watchdog Timer Enabled/Disabled

Jumper JP37 allows you to enable or disable the Watchdog feature. The normal (default) position is open to disable the Watchdog timer. See the table below for jumper settings.

Watchdog Enable/Disable Jumper Settings (JP37)	
Jumper Position	Definition
Open	Disabled
Closed	Enabled

Figure 17: Watchdog Timer Enabled/Disabled

Thermal Fan Enabled/Disabled

JP38 allows you to enable or disable the thermal fan. When enabled, the fan will operate continuously. When disabled, it will operate only when a predefined temperature threshold has been exceeded. See the table on the right for jumper settings.

**Thermal Fan
Enable/Disable
Jumper Settings (JP38)**

Jumper Position	Definition
Open	Disabled
Closed	Enabled

Figure 18: Thermal Fan Enabled/Disabled

PCI-X Bus Speed Settings

Jumpers JP10 through JP21 are used to set the speed for the PCI-X buses. The Viglen VIG340B Server Board has two P64DH2 PCI Bridge chips, each of which has two buses. Each of the following settings corresponds to a single bus.

Slot #6: Refer to the table below to set the speed of slot #6 with jumpers JP14, JP15 and JP13.

PCI-X Bus Speed Jumper Settings (for Slot #6)				
JP14	JP15	JP13	Protocol	Max. Freq.
Off	Off	Off	PCI-X	133 MHz
Off	On	Off	PCI-X	100 MHz
Off	On	Pins 1-2	PCI-X	66 MHz
Off	On	Pins 2-3	PCI	66 MHz
On	On	Pins 2-3	PCI	33 MHz

Default setting →

Jumpers JP13, JP14 and JP15

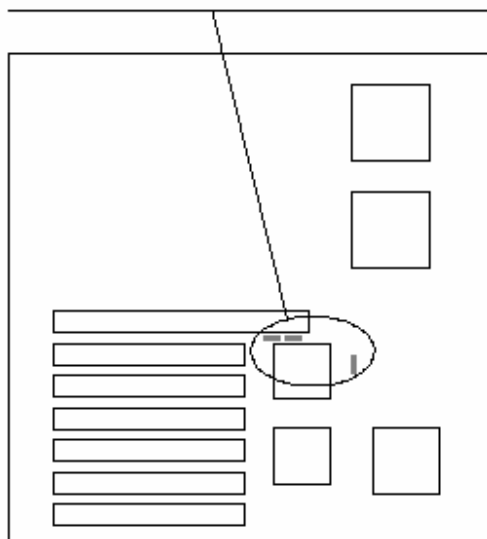


Figure 19: Slot #6 PCI-X Settings

Slot #5: Refer to the table below to set the speed of slot #5 with jumpers JP10, JP11 and JP12.

PCI-X Bus Speed Jumper Settings (for Slot #5)				
JP10	JP11	JP12	Protocol	Max. Freq.
Off	Off	Off	PCI-X	133 MHz
Off	On	Off	PCI-X	100 MHz
Off	On	Pins 1-2	PCI-X	66 MHz
Off	On	Pins 2-3	PCI	66 MHz
On	On	Pins 2-3	PCI	33 MHz

Default setting →

Jumpers JP10, JP11 and JP12

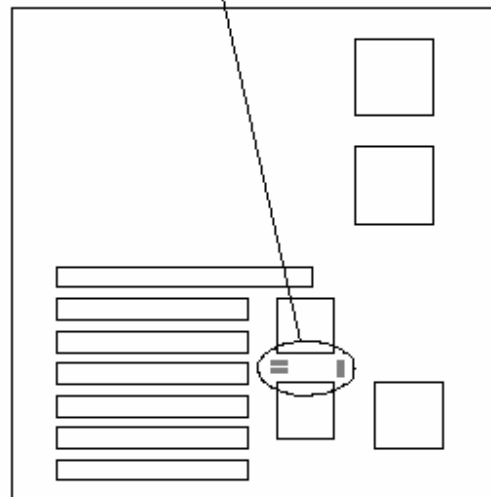


Figure 20: Slot #5 PCI-X Settings

Slot #4: Refer to the table below to set the speed of slot #4 with jumpers JP16, JP17 and JP18.

NOTE: Slot 4 shares its bus with the onboard SCSI, which pulls the slot speed down to 66 MHz. If you wish to use a 133 or 100 MHz card in slot 4, you must disable the onboard SCSI. (Otherwise, use the card in slot 5 or 6.)

**PCI-X Bus SpeedJumper Settings
(for Slot #4)**

JP16	JP17	JP18	Protocol	Max. Freq.
Off	Off	Off	PCI-X	133 MHz
Off	On	Off	PCI-X	100 MHz
Off	On	Pins 1-2	PCI-X	66 MHz
Default setting → Off	On	Pins 2-3	PCI	66 MHz
On	On	Pins 2-3	PCI	33 MHz

Jumpers JP16, JP17 and JP18

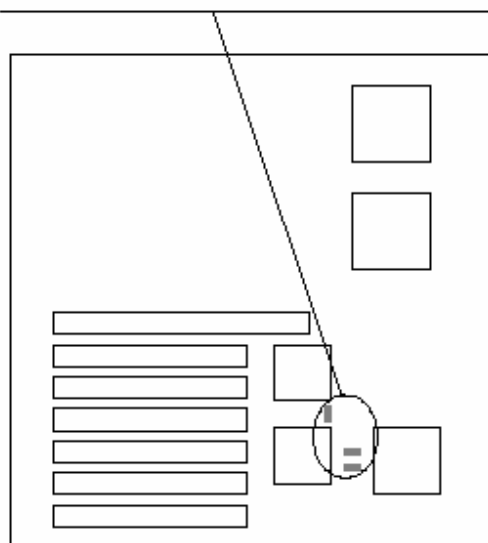


Figure 21: Slot #4 PCI-X Settings

Slot #1, #2 and #3: Refer to the table below to set the speed of slots #1, #2 and #3 with jumpers JP20, JP21 and JP19.

NOTE: If two cards are used in slots 1 through 4 they will operate as 66 MHz (max.) PCI cards. You may run a single 66 MHz PCI-X card in slots 1-4 only if the other three slots remain empty.

PCI-X Bus Speed Jumper Settings (for Slot #1, #2, #3)				
	JP20	JP21*	JP19	Protocol Max. Freq.
	Off	On	Pins 1-2	PCI-X 66 MHz
Default setting →	Off	On	Pins 2-3	PCI 66 MHz
	On	On	Pins 2-3	PCI 33 MHz

***Note that JP21 is hardwired closed as only 66 and 33 MHz are available for these slots.**

Jumpers JP19, JP20 and JP21

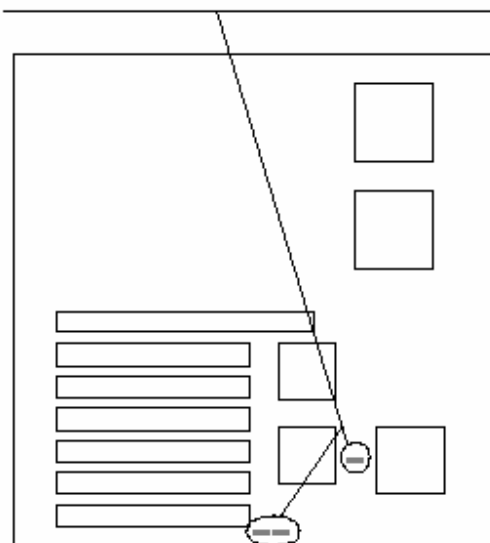


Figure 22: Slot #1, #2 & #3 PCI-X Settings

Overview of Server Board Connectors

Front Control Panel Connector

JF2 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. See Figure 23 for the descriptions of the various control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

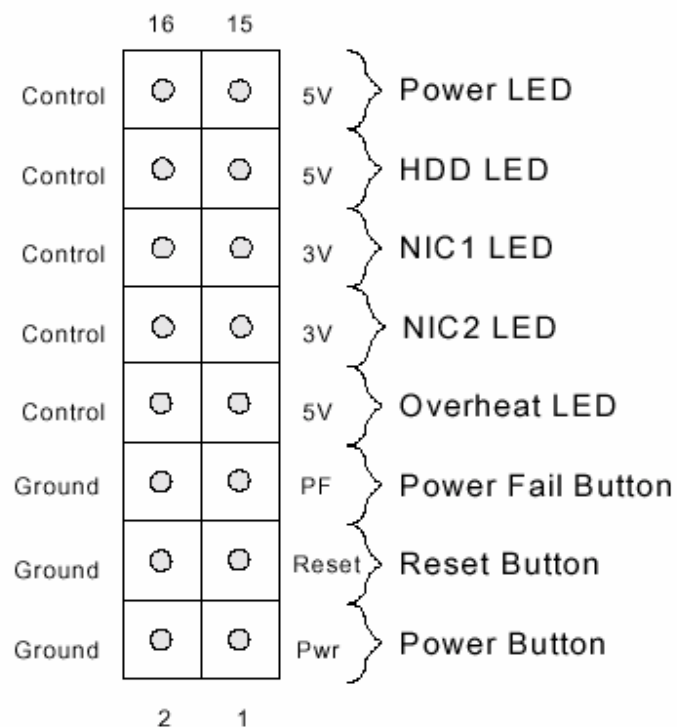


Figure 23: JF2 Front Control Panel Header Pins

ATX Power Connection

The power supply connector meets the SSI (Superset ATX) 24-pin specification; however it also supports a 20-pin power supply connector. Make sure that the orientation of the PS connector is correct. See the table below for pin definitions.

ATX Power Supply 24-pin Connector Pin Definitions			
Pin Number Definition		Pin Number Definition	
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Figure 24: ATX Power Connection

PWR_SEC Connection

For high-load configurations, it is recommended that you also provide secondary power to the motherboard with the 8-pin connector at J15. See the table below for pin definitions.

8-Pin +12v Power Supply
Connector (J15)

Pins	Definition
1 thru 4	Ground
5 thru 8	+12v

Figure 25: PWR_SEC Connection

Power LED

The Power LED connection is located on pins 15 and 16 of JF2. Refer to the table below for pin definitions.

**PWR_LED Pin Definitions
(JF2)**

Pin Number	Definition
15	+5V
16	Control

Figure 26: Power LED

Hard Disk LED

The HDD LED (IDE) connection is located on pins 13 and 14 of JF2. Attach the IDE hard drive LED cable to these pins to display disk activity. Refer to the table below for pin definitions.

**(IDE) HDD LED Pin
Definitions
(JF2)**

Pin Number	Definition
13	+5V
14	HD Active

Figure 27: Hard Disk LED

NIC2 LED

The NIC2 (Network Interface Controller) LED connection is located on pins 9 and 10 of JF2. Attach the NIC2 LED cable to display network activity. Refer to the table below for pin definitions.

**NIC2 LED Pin
Definitions
(JF2)**

Pin Number	Definition
9	+5V
10	GND

Figure 28: NIC2 LED

NIC1 LED

The NIC1 (Network Interface Controller) LED connection is located on pins 11 and 12 of JF2. Attach the NIC1 LED cable to display network activity. Refer to the table below for pin definitions.

**NIC1 LED Pin
Definitions
(JF2)**

Pin Number	Definition
11	+5V
12	GND

Figure 29: NIC1 LED

Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF2 to provide advanced warning of chassis overheating. Refer to the table below for pin definitions.

**Overheat (OH) LED
Pin Definitions
(JF2)**

Pin Number	Definition
7	+5V
8	GND

Figure 30: Overheat LED (OH)

Power Fail Button

The Power Fail Button connection is located on pins 5 and 6 of JF2. Refer to the table below for pin definitions.

**Power Fail Button
Pin Definitions
(JF2)**

Pin Number	Definition
5	Control
6	GND

Figure 31: Power Fail Button

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF2. Attach it to the hardware reset switch on the computer case. Refer to the table below for pin definitions.

**Reset Pin
Definitions
(JF2)**

Pin Number	Definition
3	Reset
4	Ground

Figure 32: Reset Button

Power Button

The Power Button connection is located on pins 1 and 2 of JF2. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (see the Power Button Mode setting in BIOS). To turn off the power when set to suspend mode, de-press the button for at least 4 seconds. Refer to the table below for pin definitions.

**Power Button
Connector
Pin Definitions
(JF2)**

Pin Number	Definition
1	PW_ON
2	Ground

Figure 33: Power Button

Universal Serial Bus (USB 0/1)

Two Universal Serial Bus ports are located beside the PS/2 keyboard/mouse ports. USB0 is the bottom connector and USB1 is the top connector. See the table below for pin definitions.

Universal Serial Bus Pin Definitions			
USB0		USB1	
Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	N/A	5	Key

Figure 34: Universal Serial Bus (USB 0/1)

Extra Universal Serial Bus Header (USB 2/3/4)

The USB2/USB3 headers are located at J13/J14 for front side USB access. You will need a USB cable (not included) to use either connection. Refer to the tables on the right for pin definitions. An additional header (USB4) designated J27 is also provided.

USB2 Pin Definitions (J13)		USB3 Pin Definitions (J14)	
Pin Number	Definition	Pin Number	Definition
2	Power	1	Power
4	-	3	-
6	+	5	+
8	Ground	7	Ground

Figure 35: Extra Universal Serial Bus Header (USB 2/3/4)

Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

Serial Ports

The COM1 serial port is located under the parallel port (see Figure 6). See the table below for pin definitions. The COM2 connector is a header located near the PCI-X #1 slot on the motherboard.

**Serial Port Pin Definitions
(COM1, COM2)**

Pin Number	Definition	Pin Number	Definition
1	DCD	6	CTS
2	DSR	7	DTR
3	Serial In	8	RI
4	RTS	9	Ground
5	Serial Out	10	NC

Figure 36: Serial Port

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J9. See the table below for pin definitions. (The mouse port is above the keyboard port, See Figure 6.)

**PS/2 Keyboard
and Mouse Port
Pin Definitions
(J9)**

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Figure 37: ATX PS/2 Keyboard and PS/2 Mouse Ports

Fan Headers

The motherboard has six CPU and chassis fan headers. These are designated CPU Fan1, CPU Fan2, CPU1 Chassis Fan, CPU2 Chassis Fan, Chassis Fan1, Chassis Fan2 and Overheat Fan. See the table below for pin definitions.

Fan Header Pin Definitions

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: These fan headers are DC power.

Figure 38: Fan Headers

Power LED/Speaker/NMI

On the 9-pin JDI header, pins 1-3 are for a power LED, pins 4-7 are for the speaker and pins 8-9 are for the NMI connection. See the table below for speaker pin definitions.

NOTE: The speaker connector pins are for use with an external speaker. If you wish to use the onboard audio, you should close pins 6-7 with a jumper.

Speaker Connector Pin Definitions (JD1)

Pin Number	Function	Definition
4	+ Key	Red wire, Speaker data
5		No connection
6		Key
7		Speaker data

Figure 39: Power LED/Speaker/NMI

Third Power Supply Fail Header

Connect a cable from your power supply to the JP8 header to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin on JF2 to provide indication of a power failure on the chassis. See the table below for pin definitions.

**Third Power Supply Fail Header
Pin Definitions (JP8)**

Pin Number	Definition
1	P/S 1 Fail Signal
2	P/S 2 Fail Signal
3	P/S 3 Fail Signal
4	Reset (from MB)

Note: This feature is only available when using Supermicro power supplies.

Figure 40: Third Power Supply Fail Header

LAN1/2 (Ethernet Ports)

Two Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the IO backplane. These ports accept RJ45 type cables.



Figure 41: LAN 1/2 (Ethernet Ports)

Wake-On-LAN

The Wake-On-LAN header is designated as WOL. See the table below for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this feature. You must also have a LAN card with a Wake-on-LAN connector and cable.

Wake-On-LAN Pin Definitions (WOL)	
Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Figure 42: Wake-On-LAN

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table below for pin definitions. You must have a WOR card and cable to use this feature.

Wake-on-Ring Pin Definitions (JWOR)	
Pin Number	Definition
1	Ground
2	Wake-up

Figure 43: Wake-On-Ring

Parallel Port, Floppy/Hard Disk Drive and SCSI Connections

Note the following when connecting the floppy and hard disk drive cables:

- The floppy disk drive cable has seven twisted wires.
- A red mark on a wire typically designates the location of pin 1.
- A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

The parallel port is located on J7. See the table below for pin definitions.

**Parallel (Printer) Port Pin Definitions
(J7)**

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

Figure 44: Parallel Port Pin Definitions

The floppy connector is located on JP7. See the table below for pin definitions.

Floppy Connector Pin Definitions (JP7)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

Figure 45: Floppy Connector Pin Definitions

There are no jumpers to configure the onboard IDE#1 and #2 connectors (J2A and J2B, respectively). See the table below for pin definitions.

**IDE Connector Pin Definitions
(J2A, J2B)**

Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

Figure 46: IDE Connector Pin Definitions

Refer to the table below for the pin definitions of the Ultra160 SCSI connectors located at JA1, JA2 and JA4.

68-pin Ultra160 SCSI Connectors (JA1, JA2, JA4)			
Connector Contact Number	Signal Names	Connector Contact Number	Signal Names
1	+DB(12)	35	-DB(12)
2	+DB(13)	36	-DB(13)
3	+DB(14)	37	-DB(14)
4	+DB(15)	38	-DB(15)
5	+DB(P1)	39	-DB(P1)
6	+DB(0)	40	-DB(0)
7	+DB(1)	41	-DB(1)
8	+DB(2)	42	-DB(2)
9	+DB(3)	43	-DB(3)
10	+DB(4)	44	-DB(4)
11	+DB(5)	45	-DB(5)
12	+DB(6)	46	-DB(6)
13	+DB(7)	47	-DB(7)
14	+DB(P)	48	-DB(P)
15	GROUND	49	GROUND
16	DIFFSENS	50	GROUND
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	RESERVED	53	RESERVED
20	GROUND	54	GROUND
21	+ATN	55	-ATN
22	GROUND	56	GROUND
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB(8)	65	-DB(8)
32	+DB(9)	66	-DB(9)
33	+DB(10)	67	-DB(10)
34	+DB(11)	68	-DB(11)

Figure 47: Ultra 160 SCSI Connector

Installing Memory DIMMs

CAUTION!

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1 below).

1. Insert the desired number of DIMMs into the memory slots, starting with Bank 1. The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2, and so on.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

Memory Support

The VIG340B only supports ECC registered PC1600 (200 MHz DDR-RAM) memory. PC2100 DDR-RAM is supported but only at 200 MHz (PC1600 speed). PC100/133 SDRAM is not supported.

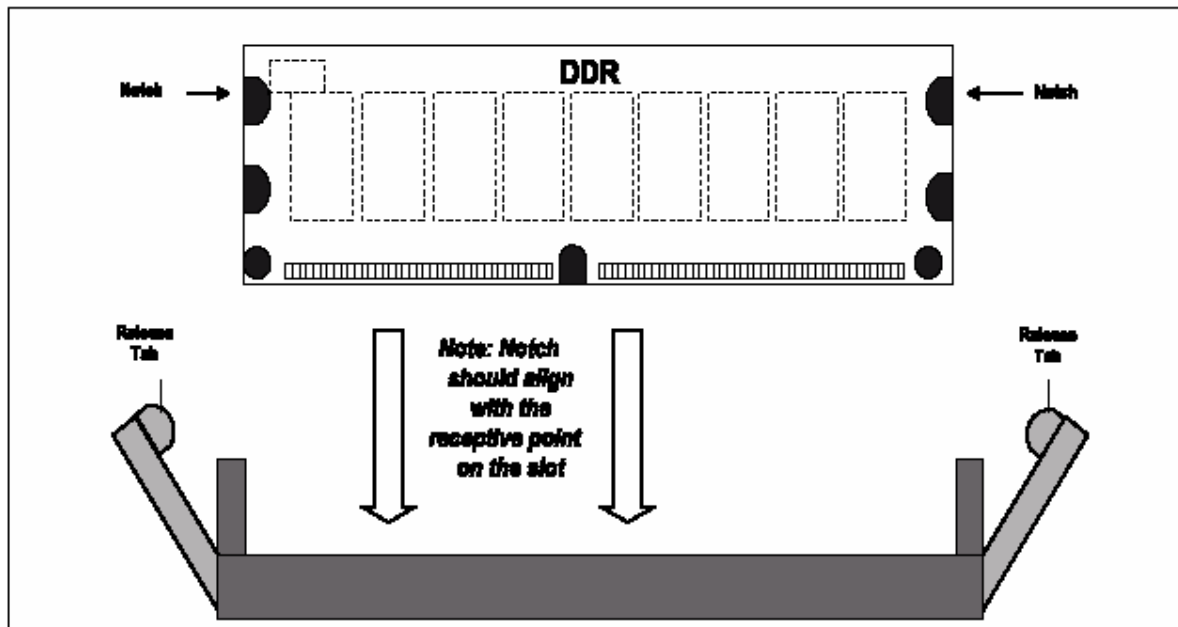


Figure 48: Installing DIMMs

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the notches.

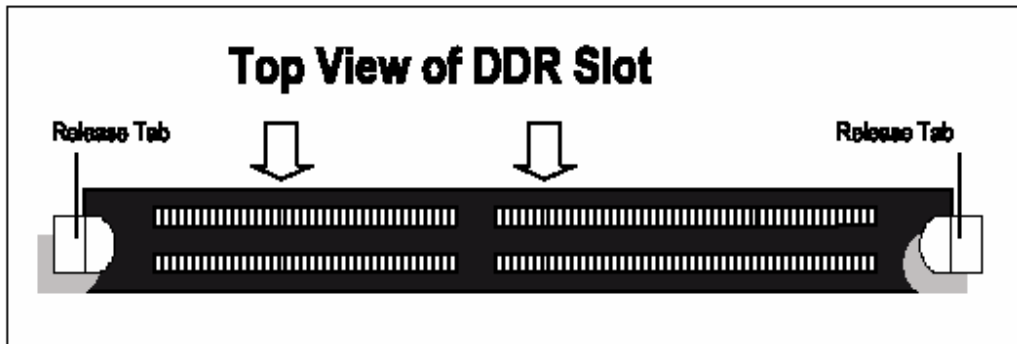


Figure 49: Removing DIMMs

To Remove: Use your thumbs to gently push near the edge of both ends of the module. This should release it from the slot.

PGA Processor and Heatsink Installation

CAUTION!

When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the CPU heat sink.

Upgrading the CPU

The new Intel Xeon processor uses a new 603-pin core package technology Micro Pin Grid Array, or Micro-PGA. This package utilises a 603-pin zero insertion force socket (PGA-603). Thermal solutions are attached directly to the back of the processor core package with the use of a thermal plate or heat spreader.

When the processor is mounted in the socket 603 connector, it is secured by the ZIF (Zero Insertion Force) socket.

The design of the VIG340B Motherboard makes it a simple job to replace or upgrade the processors. Follow the instructions below for instructions on how to upgrade the processors:

1. Before commencing any work inside your Viglen system please read the warnings and cautions section.
2. Remove the lid from the computer by removing the screws at the rear of the case.
3. Locate the Micro-PGA processors covered with a heat sink by referring to **Figure 5** if necessary.
4. Carefully remove the heat sink by pushing down and out the retention mechanism, to free it from the socket.
5. The CPU is clamped into place using a lever. Gently lift this lever, which is located at the side of the socket 603. This will free the CPU and allow you to lift it clear of the socket. Do not attempt to remove the CPU with the lever in the down position.
6. You can now fit the additional or replacement processor and heatsink into the socket 603 interface.

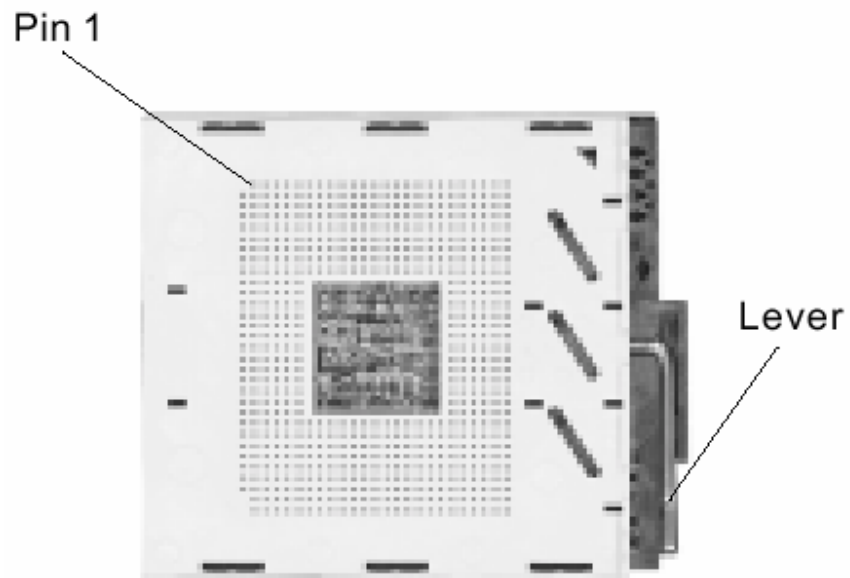


Figure 50: Socket 603 Interface

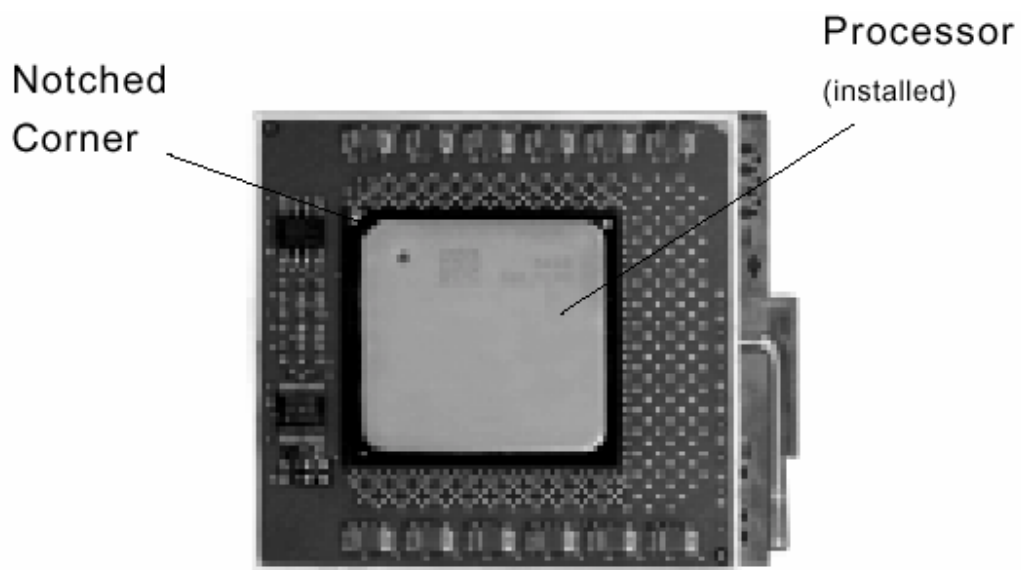


Figure 51: Xeon Micro-PGA 603-Pin Processor (Installed)

NOTE: If the CPU will not easily fit into the socket you are trying to plug it in the wrong way around.

Replacing the Clock/CMOS RAM Battery

A lithium battery is installed in a socket on the system board. The battery has an estimated life expectancy of seven years. When the battery starts to weaken, it loses voltage; when the voltage drops below a certain level, the system settings stored in CMOS RAM (for example, the date and time) may be wrong.

If the battery fails, you will need to replace it with a **VARTA CR2032** battery or an equivalent. As long as local ordinance permits, you may dispose of individual batteries as normal rubbish. Do not expose batteries to excessive heat or any naked flame. Keep all batteries away from children.

CAUTION!

Danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by Viglen. Discard used batteries according to manufacturer's instructions.

The battery is shown as 'Battery' on the motherboard layout **Figure 5**. It is located on the middle left hand side of the motherboard.

To replace the battery, carry out the following:

1. Before commencing any work inside your Viglen system please read the warnings and cautions section.
2. Turn off all peripheral devices connected to the system.
3. Turn off the system.
4. **Figure 5** shows the battery location on the motherboard.
5. Remove any components that are blocking access to the battery.
6. Gently pry the battery free from its socket, taking care to note the "+" and "-" orientation of the battery.
7. Install the new battery in the socket.

5. Software Installation

After all the hardware has been installed you must install the software drivers. The necessary drivers are all included on the SuperMicro CD that comes packaged with your Viglen Server. After inserting this CD into your CDROM drive, the display shown in Figure 52 should appear. (If this display does not appear, click on the My Computer icon and then on the icon representing your CDROM drive. Finally, double click on the S "Setup" icon.)

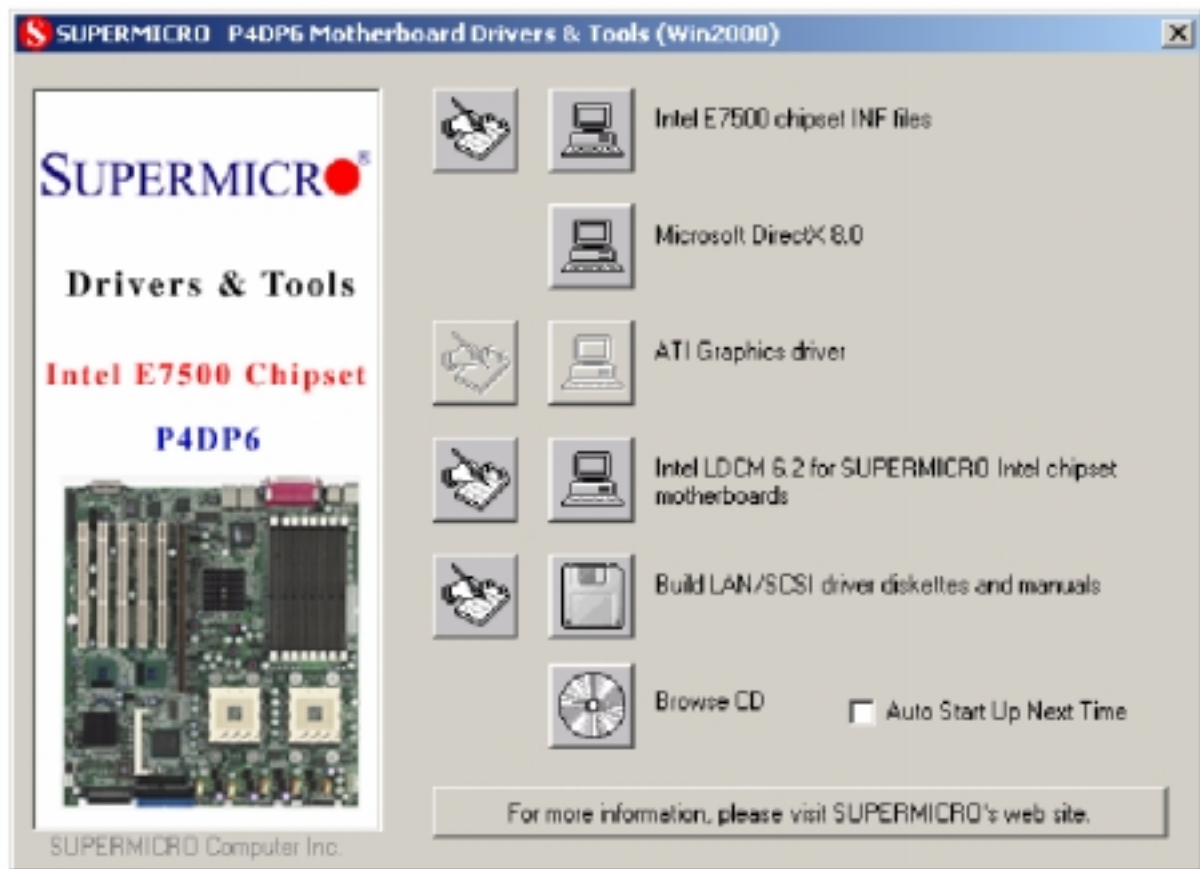


Figure 52: Driver/Tool Installation Display Screen

Click the icon showing a hand writing on paper to view the 'readme' file for each item. The bottom icon with a CD on it allows you to view the entire contents of the CD.

6. System BIOS

Introduction

This chapter describes the PhoenixBIOS™ Setup utility for the VIG340B Server Board. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

NOTE: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please visit the Viglen Support website for any changes to BIOS that may not be reflected in this manual.

www.viglen.co.uk

System BIOS

The BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The PhoenixBIOS flash chip stores the system parameters, such type of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a back-up battery provides power to the BIOS flash chip, enabling it to retain system parameters. Each time the computer is powered-on the computer is configured with the values stored in the BIOS ROM by the system BIOS, which gains control at boot-up.

How to Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot, see below.

Starting the System Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus.

Running Setup

NOTE: Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in

this section, although the screen display is often all you need to understand how to set the options.

When you first power on the computer, the PhoenixBIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the system on, or
2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

Main BIOS Setup Menu

All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the Left/Right arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ► icon. With the item highlighted, press the <Enter> key to access the submenu.

Phoenix BIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
System Time [16:19:20] System Date [02/02/02] Legacy Diskette A: [1.44/1.25 MB] Legacy Diskette B: [Not Installed] ▶ Primary Master [120 GB] ▶ Primary Slave [None] ▶ Secondary Master [CD-ROM] ▶ Secondary Slave [None] System Memory 256 MB Extended Memory 3967 KB				Item Specific Help	
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit					

Figure 53: Main BIOS Setup Menu

Main Setup Menu Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields and enter the correct data. Press the <Enter> key to save the data.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5", **1.44/1.25MB**, 3.5" and 2.88MB 3.5".

Legacy Diskette B

This setting allows the user to set the type of floppy disk drive installed as diskette B. The options are **Disabled**, 360Kb 5.25", 1.2MB 5.25", 720Kb 3.5", 1.44/1.25MB, 3.5" and 2.88MB 3.5".

► Primary Master/Primary Slave/Secondary Master/Secondary Slave

These settings allow the user to set the parameters of the IDE Primary Master/Slave and IDE Secondary Master/Slave slots. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

Phoenix BIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
Type: [Auto]				Item Specific Help	
Multi Sector Transfer; [16 Sectors]				Select the drive type of the fixed disk installed in your system. If type User is selected, Cylinders, Heads, and Sectors can be edited directly. Auto attempts to automatically detect the drive type for drives that comply with ANSI specifications.	
LBA Mode Control: [Enabled]					
32-bit I/O: [Enabled]					
Transfer Mode: [Fast PIO 4]					
Ultra DMA Mode [Disabled]					
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults					
Esc Exit ↔ Select Menu Enter Select ► Sub-Menu F10 Save and Exit					

Figure 54: Primary Master/Primary Slave/Secondary Master/Secondary Slave

Type

Selects the type of IDE hard drive. The options are **Auto** (allows BIOS to automatically determine the hard drive's capacity, number of heads, etc.), a number from 1-39 to select a predetermined type of hard drive, CD-ROM and ATAPI Removable.

Multi-Sector Transfers

Select the number of transfer sectors. Options are 2, 4, 6, 8 and **16 Sectors**.

LBA Mode Control

This item determines whether Phoenix BIOS will access the IDE Primary Master Device via LBA mode. The options are **Enabled** and Disabled.

32-Bit I/O

Selects 32-bit I/O operation. Options are Enabled and **Disabled**.

Transfer mode

Selects the transfer mode. Options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, **Fast PIO4**, FPIO3/DMA1 and FPIO4/DMA2.

Ultra DMA Mode

Selects Ultra DMA Mode. Options are **Disabled**, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4 and Mode 5.

Advanced Setup Menu

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All Advanced BIOS Setup options are described in this section.

Phoenix BIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
				Item Specific Help	
Installed OS				[Win95]	
Quick Boot Mode				[Enabled]	
Quiet Boot				[Disabled]	
Legacy USB Support				[Enabled]	
Reset Configuration Data				[No]	
▶ Cache Memory					
▶ I/O Device Configuration					
Large Disk Access Mode				[DOS]	
Local Bus IDE Adapter				[Both]	
▶ Advanced Chipset Control					
▶ Advanced Processor Options					
▶ DMI Event Logging					
▶ Console Redirection					
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults					
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit					

Figure 55: Advanced Setup Menu

Installed OS

This setting allows you to choose which operating system you are using to run the system. Options are Other, Win95, Win98, WinMe and Win2000.

Quick Boot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

Reset Configuration Data

Options are Yes and **No**. Choosing Yes will clear the Extended System Configuration Data (ECSD).

► Cache Memory

Access the submenu for this item to specify one of the following actions for various sections of cache memory: Uncache, Write Protect, Write Back, Write Through or Disable. See the "Item Specific Help" window for details.

► I/O Device Configuration

Access the submenu to make changes to the following settings.

Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. Options are Stay Off, Power On and **Last State**.

Serial Port A

This setting allows you to assign control of serial port A. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Base I/O Address

Select the base I/O address for serial port A. The options are **3F8**, 2F8, 3E8 and 2E8.

Interrupt

Select the IRQ (interrupt request) for serial port A. Options are IRQ3 and **IRQ4**.

Serial Port B

This setting allows you to assign control of serial port B. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Mode

Specify the type of device that will be connected to serial port B. Options are **Normal** and IR (for an infrared device).

Base I/O Address

Select the base I/O address for serial port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

Select the IRQ (interrupt request) for serial port B. Options are **IRQ3** and IRQ4.

Parallel Port

This setting allows you to assign control of the parallel port. The options are **Enabled** (user defined), Disabled and Auto (BIOS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **378**, 278 and 3BC.

Interrupt

Select the IRQ (interrupt request) for the parallel port. Options are IRQ5 and **IRQ7**.

Mode

Specify the parallel port mode. Options are Output Only, Bi-directional, EPP and **ECP**.

DMA Channel

Specify the DMA channel. Options are DMA1 and **DMA3**.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled and Auto (BIOS controlled).

Base I/O Address

Select the base I/O address for the parallel port. The options are **Primary** and **Secondary**.

Large Disk Access Mode

This setting determines how large hard drives are to be accessed. The options are **DOS** or **Other** (for Unix, Novell NetWare and other operating systems).

Local Bus IDE Adapter

Use this setting to enable the integrated local bus IDE adapter. Options are **Disable**, **Primary**, **Secondary** and **Both**.

► Advanced Chipset Control

Access the submenu to make changes to the following settings.

Graphics Aperture

Use this setting to specify the size of the graphics aperture for the AGP video device. Options are **4 MB**, **8 MB**, **16 MB** and **32 MB**.

Enable Memory Gap

This setting allows you to turn off system RAM to free up address space. The options for this setting are **Disabled** and **Extended**.

ECC Configuration

This setting lets you enable or disable ECC (Error Correction and Checking). The options are **ECC** and **Disabled**.

ECC Error Type

This setting lets you select which type of interrupt will be activated as a result of an ECC error. The options are **None**, **NMI** (Non-Maskable Interrupt), **SMI** (System Management Interrupt) and **SCI** (System Control Interrupt).

SERR Signal Condition

This setting specifies the conditions required to qualify as an ECC error. Options are **None**, **Single Bit**, **Multiple Bit** and **Both**.

► Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Frequency Ratio

This setting allows you to specify the value of the internal frequency multiplier of the processor, which is used to determine the processor speed. Options are x8, x16, x17, x18, x19 and x20.

Fast String Operations

This setting allows you to **Enable** or Disable fast string operations.

Compatible FPU Code

This setting allows you to Enable or **Disable** the compatible FPU code.

Split Lock Operations

This setting allows you to **Enable** or Disable split lock operations.

Hyper-threading

This setting allows you to **Enable** or Disable hyper-threading. Enabling hyper-threading results in increased CPU performance.

L3 Cache

This setting allows you to Enable or **Disable** the L3 cache.

► DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display, not a setting, informing you of the event log validity.

Event Log Capacity

This is a display, not a setting, informing you of the event log capacity.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

Event Logging

This setting allows you to **Enable** or Disable ECC event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Highlight this item and press <Enter> to clear all DMI event logs.

► Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

Specifies to redirect the console to On-board COMA or On-board COMB. This setting can also be **Disabled**.

BAUD Rate

Select the BAUD rate for console redirection.

Console Type

Choose from the available options to select the console type for console redirection.

COM Port Address

Specifies to redirect the console to On-board COMA or On-board COMB. This setting can also be **Disabled**.

BAUD Rate

Choose from the available options to select the BAUD rate for console redirection.

Flow Control

Choose from the available options to select the flow control for console redirection.

Console Connection

Select the console connection: either Direct or Via Modem.

Continue CR after POST

Choose whether to continue with console redirection after the POST routine. Options are On and **Off**.

of Video Pages to Support

Choose the number of video pages to allocate for redirection when video hardware is not available. Options are 1, 2, 3, 4, 5, 6, 7 and 8.

Security Menu

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.

Phoenix BIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
<div>Supervisor Password Is: [Clear] User Password Is: [Clear] Quiet Boot [Disabled] Set Supervisor Password [Enter] Set User Password [Enter] Password on Boot [Disabled] Fixed Disk Boot Sector [Normal]</div>				<div>Item Specific Help</div>	
<div>F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit</div>					

Figure 56: Security Menu

Supervisor Password Is:

This displays whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This displays whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Password on Boot

This setting allows you to require a password to be entered when the system boots up. Options are Enabled (password required) and Disabled (password not required).

Fixed Disk Boot Sector

This setting may offer some protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. The other option is **Normal**.

Power Menu

Choose Power from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Power setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Power BIOS settings are described in this section.

Phoenix BIOS Setup Utility			
Main	Advanced	Security	Power
<div>ACPI Mode: [Enabled] Power Savings: [Customized] Standby Timeout: [Off] Auto Suspend Timeout: [Off] Resume On Time: [Off] Resume Time: [00:00:00] Resume on Modem Ring: [Off]</div>			<div>Item Specific Help</div>
<div>F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit</div>			

Figure 57: Power Menu

ACPI Mode

Use the setting to determine if you want to employ ACPI (Advanced Configuration and Power Interface) power management on your system.

Power Savings

This setting sets the degree of power saving for the system. The options are Disabled, **Customised**, Maximum Power Savings and Maximum Performance. Customised allows you to alter the other two modes.

Auto Suspend Timeout

Use this setting to specify the period of system inactivity to transpire before entering the suspend state. Options are **Off**, 5 min, 10 min, 15 min, 20 min, 30 min, 40 min and 60 min.

Resume on Time

Select either **Off** or On, which will wake the system up at the time specified in the next setting.

Resume Time

Use this setting to specify the time you want the system to wake up (the above setting must be set to On). Enter the time with the number keys.

Resume on Modem Ring

Use this setting to enable or disable the WOR (Wake-on Ring) feature. Options are On and **Off**.

Standby Timeout

Use this setting to specify the period of system inactivity to transpire before entering the standby state. Options are **Off**, 16 sec, 32 sec, 48 sec, 1 min, 2 min, 4 min and 8 min.

Boot Menu

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Highlighting a setting with a + or – will expand or collapse that entry. See details on how to change the order and specs of boot devices in the Item Specific Help window. All Boot BIOS settings are described in this section.

Phoenix BIOS Setup Utility					
Main	Advanced	Security	Power	Boot	Exit
<div>+Removable Devices CD-ROM Drive +Hard Drive Network Boot Intel UNDI, PXE-2.0 Intel UNDI, PXE-2.0</div>				Item Specific Help	
<div>F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ► Sub-Menu F10 Save and Exit</div>					

Figure 58: Boot Menu

+Removable Devices

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of removable devices in the item Specific Help window.

CD-ROM Drive

See details on how to change the order and specs of removable devices in the Item Specific Help window.

+Hard Drive

Highlight and press <Enter> to expand the field. See details on how to change the order and specs of hard drives in the Item Specific Help window.

Network Boot

See details on how to change the order and specs of network boot devices in the Item Specific Help window.

Intel UNDI, PXE-2.0

See details on how to change the order and specs of Intel UNDI devices in the Item Specific Help window.

PIR Menu

Choose PIR from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>. PIR stands for Processor Info ROM", which allows BIOS to read certain information from the processors. Options for PIR settings are displayed by highlighting the setting option using the arrow keys and pressing <Enter>. All PIR BIOS Setup options are described in this section.

Phoenix BIOS Setup Utility						
Main	Advanced	Security	Power	Boot	PIR	Exit
<div>Select the Processor's PIR Select the Thermal Unit ▶ Processor Info ROM Data ▶ Hardware Monitor Logic</div>					<div>Item Specific Help</div>	
<div>F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit</div>						

Figure 59: PIR Menu

Select the Processor's PIR

Selects the processor PIR. Options are **A0h/A1h**, A2h/A3h, A4h/A5h, A6h/A7h, A8h/A8h, AAh/ABh, ACh/ADh and AEh/AFh.

Select the Thermal Unit

Selects the thermal unit. Options are **30h/31h**, 32h/33h, 34h/35h, 52h/53h, 54h/55h, 56h/57h, 98h/99h, 9Ah/9Bh and 9Ch/9Dh.

► Processor Info ROM Data

Highlight this and hit <Enter> to see PIR data on the following items:

- Header Info
- Processor Data
- Processor Core Data
- L3 Cache Data
- Package Data
- Part Number Data
- Thermal Reference Data
- Feature Data
- Other Data
- OEM Data

► Hardware Monitor Logic

Highlight this and hit <Enter> to see monitor data for the following items:

- CPU1 Temperature
- CPU2 Temperature
- System Temperature
- CPU Fan1/CPU1 Chassis Fan
- CPU Fan2/CPU2 Chassis Fan
- Chassis Fan 1
- Chassis Fan 2
- Processor Vcore
- 3.3V Standby
- 3.3V Vcc
- 5V Vcc
- 12V Vcc
- 1.8V Vcc
- -12V Vcc

Exit Menu

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.

Phoenix BIOS Setup Utility						
Main	Advanced	Security	Power	Boot	PIR	Exit
<div>Exit Saving Changes Exit Discarding Changes Load Setup Defaults Discard Changes Save Changes</div>					<div>Item Specific Help</div>	
<div>F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Save and Exit</div>						

Figure 60: Exit Menu

Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

Phoenix BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Failure Fixed Disk

Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

Stuck key

Stuck key on keyboard.

Keyboard error

Keyboard not working.

Keyboard Controller Failed

Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch

Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP

Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn

Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

System RAM Failed at offset: nnnn

System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

Extended RAM Failed at offset: nnnn

Extended memory not working or not configured properly at offset **nnnn**.

System battery is dead - Replace and run SETUP

The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used

System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error

The timer test failed. Requires repair of system board.

Real time clock error

Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings

BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used

Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the wait state configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS

Memory size found by POST differed from CMOS.

Diskette drive A error/Diskette drive B error

Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP

Type of floppy drive A: not correctly identified in Setup.

Incorrect Drive B type - run SETUP

Type of floppy drive B: not correctly identified in Setup.

System cache error - Cache disabled

RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:

CPU socket number for Multi-Processor error.

EISA CMOS not writeable

ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed

ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

Software NMI Failed

ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed

ServerBIOS2 test error: Fail-Safe Timer takes too long.

Device Address Conflict

Address conflict for specified **device**.

Allocation Error for: device

Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive

CD ROM Drive identified.

Entering SETUP ...

Starting Setup program

Failing Bits: nnnn

The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n

Fixed disk **n** (0-3) identified.

Invalid System Configuration Data

Problem with NVRAM (CMOS) data.

I/O device IRQ conflict

I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:

PS/2 Mouse installed.

nnnn KB Extended RAM Passed

Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed

Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed

Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed

Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu

There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found

Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn

Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????**. Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

Parity Check 2 nnnn

Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????**.

Press <F1> to resume, <F2> to Setup, <F3> for previous

Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialisation error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup

Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:

PS/2 mouse identified.

Run the I2O Configuration Utility

One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed

System BIOS copied to shadow RAM.

UMB upper limit segment address: nnnn

Displays the address **nnnn** of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed

Video BIOS successfully copied to shadow RAM.

Phoenix BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the PhoenixBIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display a POST code that describes the problem. BIOS may also issue one of the following beep codes:

- 1 long and two short beeps - video configuration error
- 1 continuous long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialise video and write the error in the top left corner of the screen. The following is a list of codes that may be written to port 80h.

Table 6: Phoenix BIOS POST Codes

POST Code	Description
02h	Verify Real Mode.
03h	Disable Non-Maskable Interrupt (NMI).
04h	Get CPU type.
06h	Initialise system hardware.
07h	Disable shadow and execute code from the ROM.
08h	Initialise chipset with initial POST values.
09h	Set IN POST flag.
0Ah	Initialise CPU registers.
0Bh	Enable CPU cache.
0Ch	Initialise caches to initial POST values.
0Eh	Initialise I/O component.
0Fh	Initialise the local bus IDE.
10h	Initialise Power Management.
11h	Load alternate registers with initial POST values.
12h	Restore CPU control word during warm boot.
13h	Initialise PCI Bus Mastering devices.
14h	Initialise keyboard controller.
16h	1-2-2-3 BIOS ROM checksum.
17h	Initialise cache before memory Auto size.
18h	8254 timer initialisation.
1Ah	8237 DMA controller initialisation.
1Ch	Reset Programmable Interrupt Controller.
20h	1-3-1-1 Test DRAM refresh.
22h	1-3-1-3 Test 8742 Keyboard Controller.
24h	Set ES segment register to 4 GB.

28h	Auto size DRAM.
29h	Initialise POST Memory Manager.
2Ah	Clear 512 KB base RAM.
2Ch	1-3-4-1 RAM failure on address line xxxx *.
2Eh	1-3-4-3 RAM failure on data bits xxxx * of low byte of memory bus.
2Fh	Enable cache before system BIOS shadow.
32h	Test CPU bus-clock frequency.
33h	Initialise Phoenix Dispatch Manager.
36h	Warm start shut down.
38h	Shadow system BIOS ROM.
3Ah	Auto size cache.
3Ch	Advanced configuration of chipset registers.
3Dh	Load alternate registers with CMOS values.
41h	Initialise extended memory for RomPilot.
42h	Initialise interrupt vectors.
45h	POST device initialisation.
46h	2-1-2-3 Check ROM copyright notice.
47h	Initialise I20 support.
48h	Check video configuration against CMOS.
49h	Initialise PCI bus and devices.
4Ah	Initialise all video adapters in system.
4Bh	QuietBoot start (optional).
4Ch	Shadow video BIOS ROM.
4Eh	Display BIOS copyright notice.
4Fh	Initialise MultiBoot.
50h	Display CPU type and speed.
51h	Initialise EISA board.
52h	Test keyboard.
54h	Set key click if enabled.
55h	Enable USB devices.
58h	2-2-3-1 Test for unexpected interrupts.
59h	Initialise POST display service.
5Ah	Display prompt "Press F2 to enter SETUP".
5Bh	Disable CPU cache.
5Ch	Test RAM between 512 and 640 KB.
60h	Test extended memory.
62h	Test extended memory address lines.
64h	Jump to UserPatch1.
66h	Configure advanced cache registers.
67h	Initialise Multi Processor APIC.
68h	Enable external and CPU caches.
69h	Setup System Management Mode (SMM) area.
6Ah	Display external L2 cache size.
6Bh	Load custom defaults (optional).
6Ch	Display shadow-area message.
6Eh	Display possible high address for UMB recovery.
70h	Display error messages.
72h	Check for configuration errors.
76h	Check for keyboard errors.
7Ch	Set up hardware interrupt vectors.
7Dh	Initialise Intelligent System Monitoring.
7Eh	Initialise coprocessor if present.

80h	Disable onboard Super I/O ports and IRQs.
81h	Late POST device initialisation.
82h	Detect and install external RS232 ports.
83h	Configure non-MCD IDE controllers.
84h	Detect and install external parallel ports.
85h	Initialise PC-compatible PnP ISA devices.
86h	Re-initialise onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional).
88h	Initialise BIOS Data Area.
89h	Enable Non-Maskable Interrupts (NMIs).
8Ah	Initialise Extended BIOS Data Area.
8Bh	Test and initialise PS/2 mouse.
8Ch	Initialise floppy controller.
8Fh	Determine number of ATA drives (optional).
90h	Initialise hard-disk controllers.
91h	Initialise local-bus hard-disk controllers.
92h	Jump to UserPatch2.
93h	Build MPTABLE for multi-processor boards.
95h	Install CD ROM for boot.
96h	Clear huge ES segment register.
97h	Fix up Multi Processor table.
98h	1-2 Search for option ROMs. One long, two short beeps on checksum failure.
99h	Check for SMART Drive (optional).
9Ah	Shadow option ROMs.
9Ch	Set up Power Management.
9Dh	Initialise security engine (optional).
9Eh	Enable hardware interrupts.
9Fh	Determine number of ATA and SCSI drives.
A0h	Set time of day.
A2h	Check key lock.
A4h	Initialise typematic rate.
A8h	Erase F2 prompt.
AAh	Scan for F2 key stroke.
ACH	Enter SETUP.
Aeh	Clear Boot flag.
B0h	Check for errors.
B1h	Inform RomPilot about the end of POST.
B2h	POST done - prepare to boot operating system.
B4h	1 One short beep before boot.
B5h	Terminate QuietBoot (optional).
B6h	Check password (optional).
B7h	Initialise ACPI BIOS.
B9h	Prepare Boot.
BAh	Initialise SMBIOS.
BBh	Initialise PnP Option ROMs.
BCh	Clear parity checkers.
BDh	Display MultiBoot menu.
BEh	Clear screen (optional).
BFh	Check virus and backup reminders.
C0h	Try to boot with INT 19.
C1h	Initialise POST Error Manager (PEM).
C2h	Initialise error logging.

C3h	Initialise error display function.
C4h	Initialise system error handler.
C5h	PnPnd dual CMOS (optional).
C6h	Initialise note dock (optional).
C7h	Initialise note dock late.
C8h	Force check (optional).
C9h	Extended checksum (optional).
CAh	Redirect Int 15h to enable remote keyboard.
CBh	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk.
CCh	Redirect Int 10h to enable remote serial video.
CDh	Re-map I/O and memory for PCMCIA.
CEh	Initialise digitiser and display message.
D2h	Unknown interrupt.

The following are for boot block in Flash ROM

Table 7: Boot Block in Flash ROM POST Codes

POST Code	Description
E0h	Initialise the chipset
E1h	Initialise the bridge
E2h	Initialise the CPU
E3h	Initialise system timer
E4h	Initialise system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialise Multi Processor
EAh	Initialise OEM special code
EBh	Initialise PIC and DMA
ECh	Initialise Memory type
EDh	Initialise Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialise interrupt vectors
F1h	Initialise Run Time Clock
F2h	Initialise video
F3h	Initialise System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

* If the BIOS detects error 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (xxxx) indicating the address line or bits that failed. For example, "2C 0002" means address line 1 (bit one set) has failed. "2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code,

followed by a delay, the high-order byte, another delay, and then the low order byte of the error. It repeats this sequence continuously.

Phoenix Error Beep Codes

This section lists the PhoenixBIOS Error Beep Codes.

Table 8: Phoenix BIOS Error Beep Codes

Beep Code	Error Message Description
1 long continuous beep	No memory detected
1 long + 2 short + 1 long + 2 short	No video VGA error
1 long + 3 short	Keyboard error
1 long + 9 short Long beeps	ROM error
Long beeps	Memory module error

7. Technical Information

NOTE: This chapter is indented for experienced users only, and only to be used as a reference. Changes to or modify any of the components/ connectors listed herein can and will seriously damage your system, including the motherboard, CPU and/or any other hardware.

SCSI Controller

The embedded Adaptec AIC-7899 SCSI controller incorporates an advanced multimode I/O cell that supports Ultra2, Ultra3, and Ultra160 SCSI LVD devices, as well as single-ended (SE) devices. The AIC-7899 SCSI controller is coupled with an Adaptec AIC-3860 transceiver chip to bridge the signaling discontinuity. By dividing the SCSI bus into independent single-ended and LVD segments, the AIC-3860 supports legacy devices without limiting performance.

The SCSI bus is terminated on the server board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus. The device at the end of the cable must be terminated. LVD devices generally do not have termination capabilities. Non-LVD devices generally are terminated through a jumper or resistor pack. The SCSI cable included with your server board has been modified to include active termination. The cable is capable of supporting both Ultra-2 and non-Ultra-2 SCSI devices. Proper termination of the SCSI bus is required for stable operation of SCSI devices. When attaching any SCSI device to the cable, verify that they are not terminated. This is usually a configurable option using a jumper or terminator block on the device. Check the documentation that came with your SCSI device to verify this option. Termination of the SCSI bus is implemented using the active termination on the server board along with the active termination at the end of the SCSI cable.

IDE Controller

IDE is a 16 bit interface for intelligent disk drives with disk controller electronics onboard. The device controls:

- PIO and IDE DMA/bus master operations
- Mode 4 timings
- Transfer rates up to 33 MB/s
- Buffering for PCI/IDE burst transfers
- Master/slave IDE mode
- Up to two devices per channel; two channels, IDE0 and IDE1

NOTE: 18 inch maximum length of IDE cable on each channel: You can connect an IDE signal cable, up to a maximum of 18 inches each, to each IDE connector on the server board. Each cable can support two devices, one at the end of the cable and one 6 inches from the end of the cable.

Operating Systems and IDE hard drives

Standard CHS is the translation that has been used for years. Its use limits IDE capacity to maximum of 528MB regardless of the size of the drive used.

Logical Block mode overcomes the 528MB maximum size limitation imposed by the Standard CHS mode. It should be used only when the drive supports LBA (Logical Block Addressing), and the OS supports LBA, or uses the BIOS to access the disk.

Extended CHS mode also overcomes the 528MB maximum size limitation imposed by Standard CHS mode. It can be used with drives, which are larger than 528MB that do not support LBA.

Auto Detected allows the BIOS to examine the drive and determine the optimal mode. The first choice is to utilise Logical Block mode if it is supported by the drive. The second choice is to utilise Extended CHS mode if the drive topology allows. If neither of the above methods is possible, the Standard CHS mode is used.

Different operating systems have different abilities regarding IDE translation mode.

UNIX operating systems (as currently implemented) do not support either LBA or ECHS and must utilise the standard CHS method. UNIX can support drives larger than 528MB, but does so in its own way.

OS/2 2.1 and OS/2 Warp can support LBA, ECHS or standard CHS methods. Note that LBA support may require a switch setting on an OS/2 driver in order to operate in that mode.

OS/2 2.0 & Novel NetWare can support either ECHS or standard CHS methods. In order to use LBA with NetWare a driver that supports current parameters must be used. OS/2 2.0 does not support LBA.

DOS & Windows can use LBA, ECHS or standard CHS methods. The '32-bit Disk Access' driver built into Windows WDCTRL.386 can only be used with the standard CHS method, to use either LBA or ECHS method and '32-bit Disk Access' an alternative .386 driver must be installed; this combination will also provide the best performance. If this driver is not installed and the drive fitted to the system supports Type F DMA on the ISA interface or Mode 3 on the PCI interface then higher performance will be achieved by NOT using '32-bit Disk Access'.

Network Controller

The VIG340B motherboard includes a 10BASE-T/100BASE-TX network solution based on the Intel 82550 single chip Fast Ethernet PCI Bus Controller. As a PCI bus master, the controller can burst data at up to 132 MB/s. The controller contains two receive and transmit FIFO buffers that prevent data overruns or underruns while waiting for access to the PCI bus. The controller has the following:

- 32 bit PCI bus master interface (direct drive of bus), compatible with PCI Bus Specification, Revision 2.1
- Chained memory structure with improved dynamic transmit chaining for enhanced performance
- Programmable transmit threshold for improved bus utilisation
- Early receive interrupt for concurrent processing of receive data
- Onchip counters for network management
- Autodetect and autoswitching for 10 or 100 Mbps network speeds
- Support for both 10 Mbps and 100 Mbps networks, capable of full or half duplex, with back-to-back transmit at 100 Mbps
- Support for IP Security

The network status LEDs on the server board indicate:

- Transmit/receive activity on the LAN
- Valid link to the LAN
- 10/100 Mbps transfer mode

Use Only for Intended Applications

This product was evaluated as Information Technology Equipment (ITE) that may be installed in offices, homes, schools, computer rooms and similar locations. The suitability of this product for other Product Categories and Environments other than ITE applications, (such as medical, industrial, alarm systems, and test equipment) may require further evaluation.

When you integrate this subassembly, observe all warnings and cautions in the Installation Guide.

To avoid injury, be careful of:

- Sharp pins on connectors
- Sharp pins on printed circuit assemblies
- Rough edges and sharp corners on the chassis
- Hot components (like processors, voltage regulators, and heat sinks)
- Damage to wires that could cause a short circuit

Equipment Log and Worksheets

Use the blank equipment log provided here to record information about your LX245 Server.

Table 9: Equipment Log and Worksheet

Item	Manufacturer Name & Model Number	Serial Number	Date Installed
Chassis			
Main board			
Processor speed and cache			
Memory			
Video display			
Keyboard			
Mouse			
Diskette drive A			
CD-ROM drive			
Additional 5.25" Peripheral			
IDE hard disk drive			
SCSI hard disk drive 1			
SCSI hard disk drive 2			
SCSI hard disk drive 3			
SCSI hard disk drive 4			
SCSI hard disk drive 5			
SCSI hard disk drive 6			

Worksheet, Calculating DC Power Usage

1. List the current for each board and device in the appropriate voltage level column.
2. Add the currents in each column. Then go to the next worksheet.

Table 10: Worksheet, Calculating DC Power Usage

	Current (maximum) at voltage level:					
Device	+3.3 V	+5 V	–5 V	+12 V	–12 V	5V standby
Baseboard, front panel board and fans						
Processor(s)						
Memory						
3.5-inch diskette drive						
CD-ROM drive						
Second 5.25-inch device						
Third 5.25-inch device						
1st hard drive						
2nd hard drive						
3rd hard drive						
4th hard drive						
5th hard drive						
6th hard drive						
SCSI backplane						
Power share board						
Expansion board 1						
Expansion board 2						
Expansion board 3						
Expansion board 4						
Expansion board 5						
Expansion board 6						
Expansion board 7						
Total Current						
Maximum Ratings (for comparison)						

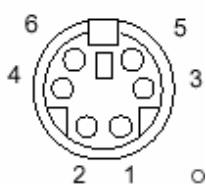
Connector Pin Signal Details

Fan Connector

Table 11: Fan Connector Pin-out (Thermal, CPU and Chassis Fans

Pin	Signal Name
1	Ground (black)
2	+12 V (red)
3	Tachometer

Keyboard and Mouse



The PS/2-compatible connectors share a common housing; they are functionally equivalent.

Table 12: PS/2 Keyboard/Mouse Connectors

Pin	Signal Name	Description
1	KEYDAT / MSEDAT	Data
2	NC	No connect
3	GND	Ground
4	FUSED_VCC	+5 V (fused)
5	KEYCLK / MSECLK	Clock
6	NC	No connect

Serial Ports COM1 and COM2

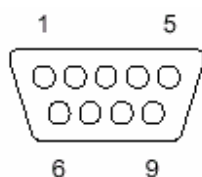


Table 13: Serial Port Connectors

Pin	Signal Name
1	DCD
2	DSR
3	Serial In
4	RTS
5	Serial Out
6	CTS
7	DTR

8	RI
9	Ground

Parallel Port

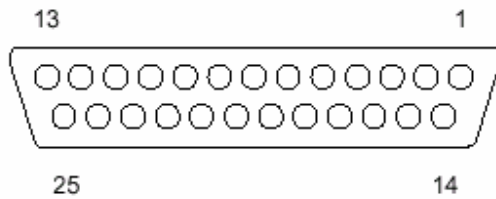


Table 14: Parallel Port Connector

Pin	Signal Name	Pin	Signal Name
1	Strobe#	14	Auto Feed#
2	Data bit 0	15	Error#
3	Data bit 1	16	INIT#
4	Data bit 2	17	SLCT IN#
5	Data bit 3	18	Ground
6	Data bit 4	19	Ground
7	Data bit 5	20	Ground
8	Data bit 6	21	Ground
9	Data bit 7	22	Ground
10	ACK#	23	Ground
11	Busy	24	Ground
12	PE	25	Ground
13	Select		

Floppy Drive

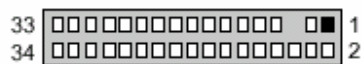


Table 15: Floppy Drive Connector Pin-out

Pin	Signal Name	Pin	Signal Name
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index#
9	Ground	10	Motor Enable
11	Ground	12	Drive Select B
13	Ground	14	Drive Select A
15	Ground	16	Motor Enable
17	Ground	18	DIR
19	Ground	20	STEP
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 00

27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1 Select
33	Ground	34	Diskette

IDE

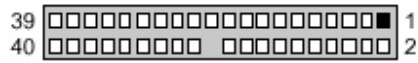


Table 16: IDE Connectors

Pin	Signal Name	Pin	Signal Name
1	Reset IDE	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	Key
21	DDRQ3	22	Ground
23	I/O Write#	24	Ground
25	I/O Read#	26	Ground
27	IOCHRDY	28	BALE
29	DDACK3#	30	Ground
31	IRQ 14	32	IOCS 16#
33	Address 1	34	ground
35	Address 0	36	Address 2
37	Chip Select 0#	38	Chip Select 1#
39	Activity#	40	Ground

ATX Power Supply

Table 17: Main Power Supply Connector

Pin	Signal Name	Pin	Signal Name
1	3.3V	11	3.3V
2	3.3V3	12	-12V
3	Ground	13	Ground
4	5V	14	PS-ON
5	Ground	15	Ground
6	5V	16	Ground
7	Ground	17	Ground
8	PW-OK	18	-5V
9	5VSB	19	5V
10	12V	20	5V

Universal Serial Bus (USB)



Table 18: USB Connector Pinout

Pin	Signal Name	Pin	Signal Name
1	+5V	11	+5V
2	PO-	12	PO-
3	PO+	13	PO+
4	Ground	14	Ground
5	N/ A	15	Key

50- Pin Legacy SCSI Connector

Table 19: 50-pin SCSI Pinout

Pin	Signal Name	Pin	Signal Name
1	Ground	26	-DB (0)
2	Ground	27	-DB (1)
3	Ground	28	-DB (2)
4	Ground	29	-DB (3)
5	Ground	30	-DB (4)
6	Ground	31	-DB (5)
7	Ground	32	-DB (6)
8	Ground	33	-DB (7)
9	Ground	34	-DB (P)
10	Ground	35	Ground
11	Reserved	36	Ground
12	Open	37	Reserved
13	Reserved	38	Termpwr
14	Ground	39	Reserved
15	Ground	40	Ground
16	Ground	41	-ATN
17	Ground	42	Ground
18	Ground	43	-BSY
19	Ground	44	-ACK
20	Ground	45	-RST
21	Ground	46	-MSG
22	Ground	47	-SEL
23	Ground	48	-C/D
24	Ground	49	-REQ
25	Ground	50	-I/O

Ultra Wide SCSI Connector



Table 20: 68-Pin SCSI Pinout

Pin	Signal Name	Pin	Signal Name
1	Ground	35	-DB (12)
2	Ground	36	-DB (13)
3	Ground	37	-DB (14)
4	Ground	38	-DB (15)
5	Ground	39	Parity H
6	Ground	40	-DB (0)
7	Ground	41	-DB (1)
8	Ground	42	-DB (2)
9	Ground	43	-DB (3)
10	Ground	44	-DB (4)
11	Ground	45	-DB (5)
12	Ground	46	-DB (6)
13	Ground	47	-DB (7)
14	Ground	48	Parity L
15	Ground	49	Ground
16	Ground	50	Tempwrd
17	Tempwrd	51	Tempwrd
18	Tempwrd	52	Tempwrd
19	Ground	53	NC
20	Ground	54	Ground
21	Ground	55	-ATN
22	Ground	56	Ground
23	Ground	57	-BSY
24	Ground	58	-ACK
25	Ground	59	-RST
26	Ground	60	-MSG
27	Ground	61	-SEL
28	Ground	62	-C/D
29	Ground	63	-REQ
30	Ground	64	-I/O
31	Ground	65	-DB (8)
32	Ground	66	-DB (9)
33	Ground	67	-DB (10)
34	Ground	68	-DB (11)

Ultra 160 SCSI Connector



Table 21: Ultra160 SCSI Pinout

Pin	Signal Name	Pin	Signal Name
1	+DB (12)	35	-DB (12)
2	+DB (13)	36	-DB (13)
3	+DB (14)	37	-DB (14)
4	+DB (15)	38	-DB (15)
5	+DB (P1)	39	-DB (P1)
6	+DB (0)	40	-DB (0)
7	+DB (1)	41	-DB (1)
8	+DB (2)	42	-DB (2)
9	+DB (3)	43	-DB (3)
10	+DB (4)	44	-DB (4)
11	+DB (5)	45	-DB (5)
12	+DB (6)	46	-DB (6)
13	+DB (7)	47	-DB (7)
14	+DB (P)	48	-DB (P)
15	Ground	49	Ground
16	DIFFSENS	50	Ground
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	Reserved	53	Reserved
20	Ground	54	Ground
21	+ATN	55	-ATN
22	Ground	56	Ground
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB (8)	65	-DB (8)
32	+DB (9)	66	-DB (9)
33	+DB (10)	67	-DB (10)
34	+DB (11)	68	-DB (11)

Other Information

Reliability

The mean time between failures (MTBF) prediction is calculated using component and subassembly random failure rates. The calculation is based on the Bellcore Reliability Prediction Procedure, TR-NWT-000332, Issue 4, September 1991.

The MTBF prediction is for:

- Redesigning the motherboard for alternate components if failure rates exceed reliability expectations
- Estimating repair rates and spare parts requirements

MTBF data is calculated from predicted data @ 35 °C.

The MTBF prediction for the motherboard is 120,402 hours.

8. Glossary

A	Ampere, This is a term of measurement for electric current.
AC	Alternating Current used to describe the mains voltage.
Ampere	This is a term of measurement of electric current.
Analog	Pertaining to data in the form of continuously variable quantities. Contrasts with Digital.
ANSI	American National Standards Institute.
ASCII	American Standard Coded for Information Interchange. This is a special 7/8 bit code that is given to identify characters.
Asynchronous	A method of transmission of data in which the bits included in a character or block of characters occur during a specific time interval. The start of each character block can occur at any time during this interval. Contrasts with synchronous.
AUTOEXEC.BAT	A special batch file, which contains a series of commands that are to be executed when the computer is started up.
BASIC	Beginner's All-purpose Symbolic Instruction Code. This is a simple programming language.
Battery-Backed RAM	A type of memory that holds information even when the computer is switched off.
Baud	A term used to measure modem data rates.
Binary	Involving a choice of two conditions, such as "yes" or "no", "1" or "0", base-2 mathematics.
BIOS	Basic Input Output System. This is the program held in the computer's ROM which handles all the input and output functions.
Bit	Synonym for Binary digit. A single unit of information which can hold a value of 0 or 1.

Boot	The name given to the program that runs on the computer when it is first switched on. Can also be a verb related to running the program.
BSI	British Standards Institute.
Bps	Bits per second.
Buffer	An area of temporary storage.
Bus	One or more conductors used for transmitting signals.
Byte	A unit of data made up of eight Bits.
C / C++	A programming language.
Cache	A small area of high-speed memory.
Cathode Ray Tube (CRT)	Normally referred to as a monitor or VDU.
Character	A symbol on the screen or same as a Byte.
CMOS	Complementary Metal Oxide Semiconductor. A logic circuit family that uses very little power.
COM1, COM2 COM3, COM4	The names given to the serial communications ports in DOS.
CONFIG.SYS	A special purpose file which has the configuration details for the computer to set itself to when powered up.
CPS	Characters per second.
CSA	Canadian Standards Association.
Cursor	A bar on the screen that indicates where the input from the keyboard will be displayed.
DC	Direct current. Normally associated with battery current.
Digital	Pertaining to data in the form of binary digits. Contrasts with Analogue.
DIN	Deutsche Industrie Norm, specifies major connector types.

DIP	Dual In-Line Package. ICs that have two parallel rows of connections.
DMA	Direct Memory Access. A method of transferring data between main storage and I/O devices without processor intervention.
Disk	See Floppy Disk.
DOS or MS-DOS®	Disk Operating System or Microsoft® Disk Operating System. This is a low-level program that instructs the computer on basic file handling.#
DRAM	Dynamic RAM. A type of RAM that requires a periodic refresh to maintain data.
DVD	Digital Versatile Disk
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference.
EPROM	Erasable Programmable Read-Only Memory.
ESDI	Enhanced Small Device Interface, which specifies a fast hard disk interface.
FCC	Federal Communications Commission.
Firmware	A program that is resident in Read Only Memory (ROM).
Floppy Disk	A storage device consisting of a flexible magnetic disk inside a protective cover.
G	A symbol used to represent the prefix Giga. i.e. GB (Giga Byte).
GB	Gigabyte, represents 1,073,741,824 bytes (1024MB).
Hard Disk	A disk of rigid magnetic material used for mass storage.
Hardware	The physical equipment which makes up the computer system.
Hertz (Hz)	A unit of measurement of frequency amounting to one

	cycle per second.
Hex	Hexadecimal. Base-16 mathematics.
IC	Integrated Circuit.
Icon	A graphical symbol.
IDE	Integrated device interface. An AT bus specification for a fast hard disk.
IEC	International Electrotechnical Commission. Specifies standards of safety.
I/O	Input/Output. Refers to data being sent to or received from a computer.
K	Symbol used to represent Kilobyte which is 1024 bytes.
KB	Abbreviation for Kilobyte, i.e. 1024 bytes.
Kb	Abbreviation for Kilo bit, i.e. 1024 bits.
Keylock	A locking device which can deactivate a keyboard.
KHz	KiloHertz. 1000 Hertz.
LIM	Lotus/Intel/ Microsoft® Expanded Memory Manager specification.
LED	Light Emitting Diode. These are normally used as the lights on a computers front panel.
LPT1, LPT2, LPT3	Names given to the printer ports by DOS.
M	Prefix mega. Equivalent to 1024K.
mA	Milliampere. 0.001 Ampere.
MB	Abbreviation for Mega Byte i.e. 1024K Bytes.
Mb	Abbreviation for Mega Bits, i.e. 1024K bits.
Memory	An electronic component which remembers data stored in it.

MHz	Mega Hertz. 1,000,000 Hertz.
ns	Nano Second 0.000 000 001 second.
Pixel	The smallest displayable unit on a monitor or picture tube.
POST	Power-On Self Test.
RAM	Random Access Memory. Fast Read/Write memory.
RFI	Radio Frequency Interface.
ROM	Read Only Memory.
RS-232C	A standard for asynchronous serial communication.
SCSI	Small Computer Systems Interface. A multimedia bus and interface specification for fast Hard Disks, Tape Backup Units, CD ROMs and other Devices.
SIMM	Single In-Line Memory Module.
Software	Another name for a computer program.
SRAM	Static RAM. Synchronous Transmission of data between devices which are maintaining the same frequency relationship. Contrasts with asynchronous.
TPI	Tracks Per Inch.
TTL	Transistor Transistor Logic.
TUV	Technischer Überwachungs-Verein. Organisation which tests and certifies electronic equipment.
UL	Underwriter Laboratories. American Organisation specifying standards for safety of electronic equipment.
USB	Universal Serial Bus
V	Volt. Unit of measurement of potential difference.
VAC	Volts (Alternating Current).

VDE	Verband Deutscher Electrotechniker. German organisation specifying EMI suppression.
Video	Computer data or graphics displayed on a monitor or screen.
W	Watt.
Watt	Basic unit of measurement of electrical power.
Word	A number of bits or bytes making up an entity used in the transfer and calculation of data in the computer architecture. Word=16 bits(2 bytes), long word= 32bits (4 bytes).

9. Notes

10. Suggestions

Viglen is interested in continuing to improve the quality and information provided in their manuals. Viglen has listed some questions that you may like to answer and return to Viglen. This will help Viglen help to keep and improve the standard of their manuals.

1. Is the information provided in this and other manuals clear enough?

2. What could be added to the manual to improve it?

3. Does the manual go into enough detail?

4. Would you like an on-line version of this manual?

5. How do you rate the Viglen Technical support and Service Departments?

6. Are there any technological improvements that could be made to the system?

8. Other points you would like to mention?

Please return this slip to: Product Development Department
Viglen Ltd
Viglen House
Alperton Lane
Alperton
Middlesex
HA0 1DX